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SURVEY OF INDIVIDUAL USERS OF MEDLINE

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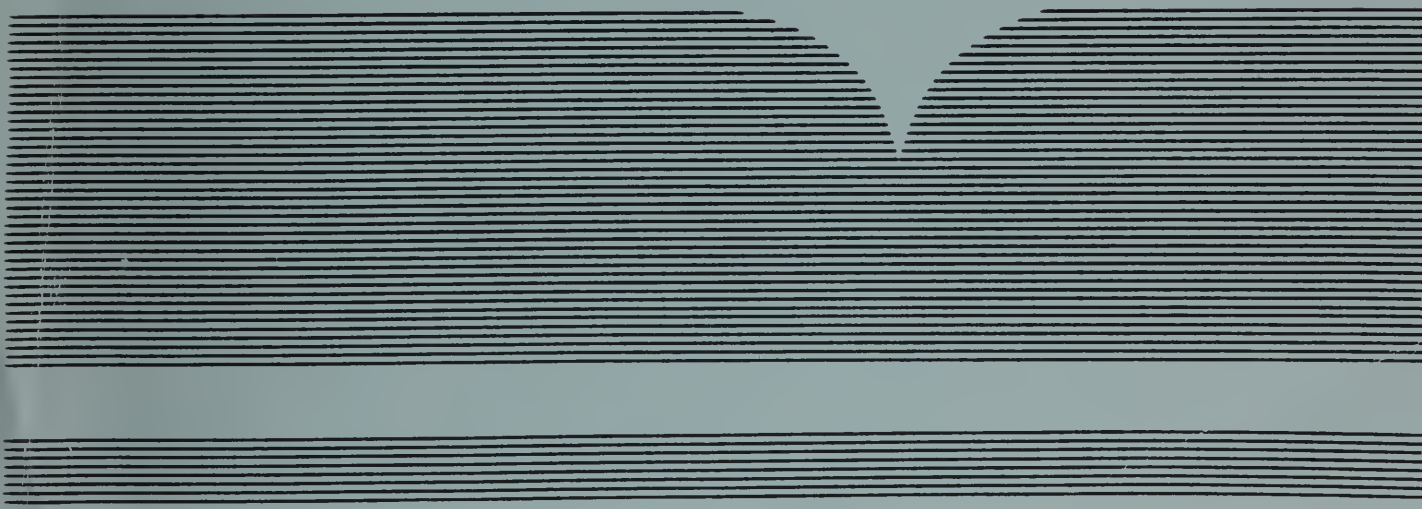

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In order to provide an online information retrieval service that individuals can use easily and effectively, NLM needed to obtain detailed information on the growing and important end-user population, their information needs, and their level of satisfaction with MEDLINE as available on the NLM system. This survey was an initial attempt to determine the demographic characteristics of individual users of MEDLINE, their methods of accessing the system, their reasons for searching, and their level of satisfaction with current system features and capabilities. The information gathered will be used to identify system improvements that can provide a better level of information service to U.S. health professionals.

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SURVEY OF
INDIVIDUAL USERS OF MEDLINE
ON THE NLM SYSTEM

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30 November 1988

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EXECUTIVE SUMMARY

INTRODUCTION

The National Library of Medicine's basic mission is to assist the progress of medicine and public health by improving the dissemination of biomedical information. In support of this goal, NLM developed MEDLARS, the automated Medical Literature Analysis and Retrieval System, and was a pioneer in offering online retrieval services over nationwide telecommunications networks. For the first 20 years of the system's existence, the principal users of MEDLARS were medical librarians who acted as search intermediaries for researchers and practitioners who needed to locate pertinent information in the health sciences literature. As more and more of these health professionals began to have access to personal computers, NLM took several steps to encourage them to search NLM's databases directly, including the provision of special short training courses in online searching and the development of GRATEFUL MED, a user-friendly interface to the NLM system. In the past three years the number of individual health professionals searching MEDLINE directly on the NLM system has increased dramatically. It is continuing to grow at the rate of over 200 users per month.

In order to provide a retrieval service that individual health professionals can use easily and effectively, NLM needs to obtain more detailed information about this growing and important end-user population, their information needs, and their level of satisfaction with MEDLINE as available on the NLM system. This survey was an initial attempt to determine the demographic characteristics of individual users of MEDLINE, their methods of access to the system, their reasons for searching, and their level of satisfaction with current system features and capabilities. The information gathered will be used to identify system improvements that can provide a better level of information service to U.S. health professionals.

METHODOLOGY

An NLM study team developed a questionnaire to elicit the types of information desired with assistance from Market Dynamics, Inc., a contractor hired to assist in tabulating the survey results. After a pre-test involving a small number of users, the questionnaire was revised and submitted for review by the U.S. Office of Management and Budget as required by the Paperwork Reduction Act. The final version of the questionnaire appears as Attachment 1.

The survey population included all who were presumed to be individual "end-users" of MEDLINE on the NLM system as of the end of July 1987. Questionnaires were mailed to these 4,311 individuals on October 2, 1987. There were two follow-up mailings, and returns were accepted until December 10, 1987.

The gross return rate was 70.1% (2,970 responses); the usable return rate was 68% (2,716 responses). Since the entire universe of individual MEDLINE users was surveyed, sampling error does not affect the results. Because the return rate was high, non-response bias is negligible. We believe the survey findings to be representative of all individual users of MEDLINE as of July 1987.

DEMOGRAPHIC CHARACTERISTICS OF SURVEY RESPONDENTS

Professions

Nearly two-thirds (65.5%) of the respondents (2,710 individuals, 99.8% of the entire respondent group) identified themselves as physicians and more than a quarter (27.7%) as scientists. 286 (10.5%) said they were both physicians and scientists. More than 40 different medical specialties were listed by the 2,197 respondents (80.9% of the entire respondent group) who provided specialty information.

Education

Most respondents hold either M.D. (1,760) or Ph.D. (570) degrees. The majority of the respondents (2,667 individuals, 98.2% of the entire respondent group) received their highest degree within the last 18 years: 40.1% during the 1970's and 27.1% in the 1980's.

Primary Work Place

Nearly all of the individuals surveyed (2,701 individuals, 99.4% of the entire respondent group) indicated a primary work place. Almost half of the respondents (46.8%) work in an academic setting (college, university, or medical school). The remaining respondents are split rather evenly among private/solo practice (12.6%), group practice (12.3%) and hospital/clinic settings (14.6%). Only 5.4% work in a government agency and 3.3% in a private company or business.

GENERAL SEARCHING BEHAVIOR

Frequency of Searching

More than two-thirds (68.6%) of the respondents (2,686 individuals, 98.9% of the entire respondent group) do all their own searches. Half of these perform two or fewer searches in an average month. For the respondents who perform at least one search in the typical month, the average number of searches performed is 4.3 searches per month.

About one-third of the respondents have someone else search for them at least occasionally. These respondents request an average of 2.5 searches from others each month.

Searches Performed by Others

A substantial majority (81.9%) of the searches respondents request from others are done by librarian/information specialists. 42.4% of the entire respondent group (1,151 individuals) indicated the reasons they occasionally have someone else search for them. The most frequently indicated reasons were: lack of time to search personally (59.3% of those who gave any reasons); the need for different expertise or system knowledge (38.7%); and lack of satisfaction with their own results for a particular search (27.5%). 70.6% of those who have others search for them (1,121 individuals, 41.3% of the entire respondent group) expressed satisfaction with the results, 8.9% are dissatisfied and 20.5% are neutral.

Searches Performed by Self

Of the 2,171 individuals (79.9% of the entire respondent group) who indicated one or more factors that influenced them to do their own searches, 83.1% selected greater familiarity with the subject matter, 82.4% marked the ability to get results faster, and 65.5% enjoyment of searching.

Level of Experience/Pattern of Use

Less than 10% of the respondents (2,561 individuals, 94.3% of the entire respondent group) regard themselves as very experienced users of online databases. The large majority consider themselves to be somewhat experienced or not very experienced. Less than 8% indicated that they were not at all experienced.

Of the 2,509 respondents (92.4% of the entire respondent group) who indicated how long they had been searching MEDLINE with their own codes, nearly two-thirds had had their codes for a year or less at the time of the survey. 27% had had their codes for one to two years. Only 10% had had their codes for more than 2 years.

A substantial majority (82%) of the respondents (2,661 individuals, 98.0% of the entire respondent group) do not share their code with anyone else.

More than half of the respondents (2,545 individuals, 93.7% of the entire respondent group) said their level of usage of the system had remained relatively constant since they received their own access codes. 30.0% indicated increased use and 12.3% said their use had decreased.

Cost Considerations

67.6% of the 2,554 respondents (94.0% of the entire respondent group) who provided an answer to the question on cost considerations indicated that cost rarely (26.6%) or never (41.0%) keeps them from performing a search. 23.1% said that costs considerations occasionally keep them from searching. Only 9.2% reported that cost considerations frequently keep them from searching. Cost is even less a consideration for those in group practice, private/solo practice, and private business than for respondents as a whole.

CHARACTERISTICS OF MEDLINE SEARCHES

General Search Purpose

Of the 2,556 individuals (94.1% of the respondent group) who provided an answer, 81.7% indicated that they typically search MEDLINE to satisfy an immediate information need; 10% typically search for information to stay current in their field. Only 5% typically search to learn about new areas.

Numbers of Citations Desired/Retrieved

Overall, more than half of the respondents (2,550 individuals, 93.9% of the entire respondent group) typically wish to retrieve all relevant citations from a particular time period rather than just a few relevant citations. The results vary substantially according to the respondents' work place and their most common search purpose, however. 65.2% of those who work in academic settings and 67.1% of those who

commonly use search information for research/testing purposes are interested in retrieving all relevant citations as opposed to 47.6% of those in group practice and 49.8% of those who most commonly use search information for patient care.

More than half of the respondents (2,510 individuals, 92.4% of the entire respondent group) typically retrieve about the right number of citations. Overall, 15% of the respondents indicated that they typically retrieve too few citations and 23.6% indicated that they typically retrieve too many. A higher percentage (23.6%) of those who always search using GRATEFUL MED form screens retrieve too few citations compared to individuals who always search using command language (10.2%).

2,399 individuals (88.3% of the entire respondent group) indicated the percentage of retrieved citations that they typically judge to be relevant to their inquiry. 58.6% of these respondents said that typically fewer than half of the citations they retrieve are relevant.

Use of Information Retrieved

Over 90% of the respondents (2,552 individuals, 94.0% of the entire respondent group) typically search for a subject rather than for an author or a journal title. Respondents were asked to rank the three primary areas in which they use MEDLINE search information. Most frequently mentioned were: research/testing (by 71% of respondents), patient care (69.1%), and education (66.0%). Overall, 45.8% ranked research/testing as their single most common use; 32.8%, patient care; and only 12.4%, education. The results varied substantially by work place. 68.8% of those in private/solo practice and 75.8% of those in group practice most commonly use MEDLINE for patient care. In contrast 66.9% of individuals in academic settings most commonly use MEDLINE for research/testing purposes.

Use of MeSH

About two-thirds of the respondents (2,544 individuals, 93.7% of the entire respondent group) always use (24.1%) or usually use (43.6%) MeSH terms when searching for specific subjects. Similar percentages of respondents find MeSH terms very useful or useful.

Length of Searches

For almost two-thirds of the respondents (2,533 individuals, 93.3% of the entire respondent group) a typical search takes less than 10 minutes. Another quarter takes 10-15 minutes. Nearly 90% of respondents think the length of time to conduct a search is reasonable.

OPINIONS ABOUT THE SYSTEM

Level of Satisfaction

1,318 individuals (48.5% of the entire respondent group) indicated a level of satisfaction with the searches they perform for themselves. Of these, 72.5% are satisfied with their searches.

93.5% of the entire respondent group (2,539 individuals) rated their level of overall satisfaction with MEDLINE on the NLM system. 81.4% of this group were satisfied, and only 4.1% dissatisfied. The rest were neutral.

Desirable Additions/Improvements to MEDLINE

60.8% of respondents (1,977 individuals, 72.8% of the entire respondent group) would find no additional types of information valuable. Of those who would like to see additional information, 79.1% indicated the full-text of articles, 37.0% author's address, 31.4% research design, and 23.6% dosage information.

78.8% of the entire respondent group (2,139 individuals) indicated features they would like to see added to MEDLINE by selecting from a list provided in the questionnaire. 71.8% of these selected improved MEDLINE backfile searching and 69.2% improved printing capabilities. These two capabilities were also the single most desired features, by 35.9% and 27.9% of respondents respectively.

ACCESS AND TRAINING

Method of Access

96% of respondents (2,708 individuals, 99.7% of the entire respondent group) have access to a microcomputer in their work places, and a similar percentage use a microcomputer to search MEDLINE.

68.9% of the entire respondent group (1,870 individuals) always use a single method to access MEDLINE. Of the 2,474 individuals (91.1% of the entire respondent group) who provided information on access methods, 43.2% always use the command language, 26.9% always use the GRATEFUL MED form screens, 4.2% always use another front-end package, and 1.8% the GRATEFUL MED direct option. The remainder use more than one method to access MEDLINE. Higher percentages of physicians and those in private/solo and group practice always use GRATEFUL MED form screens in comparison to the respondent group as a whole. The percentage of those who always use command language increases as age (indicated by year highest degree received) decreases. The reverse is true for use of GRATEFUL MED form screens.

Of the 2,392 individuals (88.1% of the entire respondent group) who answered the question regarding access problems, 53.8% reported none. The most frequent problem encountered was busy telecommunications lines (19.5%).

Learning to Search MEDLINE

2,203 individuals (81.1% of the entire respondent group) checked the methods they used to learn to search, with 2,059 individuals (75.8% of the entire respondent group) also indicating the single most helpful method. The frequently mentioned methods were: NLM sponsored training course (49.7%); GRATEFUL MED (45.3%); and self-taught (45.0%). The most helpful methods were NLM-sponsored training (42.7%) and GRATEFUL MED (31.3%). Of the 1,368 individuals who said they took either NLM's 3-5 day training class or the 6-hour Basics of Searching MEDLINE Course, over 83% were satisfied with the training, less than 4% were dissatisfied, and the rest were neutral.

COMMENTS ON THE SYSTEM

Most Satisfactory Aspects

747 individuals (27.5% of the entire respondent group) provided comments on their perceptions of the most satisfactory aspects of MEDLINE. 32.7% of these people mentioned the content of MEDLINE; 25.7% hours and availability; 24.6% speed and efficiency; 19.9% GRATEFUL MED; and 18.7% cost. The results varied based on access method. Higher percentages of those who always use the command language mentioned the content of the database and cost as compared to GRATEFUL MED form screen users. GRATEFUL MED itself was the most frequently mentioned satisfactory aspect by GRATEFUL MED form screen users.

Least Satisfactory Aspects

874 individuals (32.2% of the entire respondent group) provided comments on aspects of MEDLINE that they considered to be least satisfactory. Most frequently mentioned were GRATEFUL MED limitations, by 17.2% of those who provided comments; backfile searching, by 14.0%; and MeSH vocabulary/ indexing, by 13.7%. Again the results varied based on access method.

CONCLUSIONS

The survey data reveal two different groups of individual users. The first group is concentrated in academic settings, uses MEDLINE primarily in support of research, and is typically interested in comprehensive retrieval. Most of the people in this group are physicians or physician scientists. In July 1987, the majority in this group used the command language. The second group is made up predominantly of physicians who work in various clinical practice settings. These individuals use MEDLINE primarily in support of patient care and are more likely than the "research" users to wish to retrieve just a few relevant citations. In July 1987, a larger percentage of this group already used GRATEFUL MED as compared to the "research" group. At the time the survey was conducted, the "research" group was slightly larger than the "patient care" group; but there is evidence that the "patient care" group is growing at a faster pace.

Although the "research" and "patient care" groups have some key differences, they also have many important attributes in common. In general, they are relatively young physicians or scientists with access to microcomputers. They are likely to do their own searches. Overwhelmingly they use MEDLINE to satisfy immediate information needs rather than to stay current in their fields or to learn about new areas. They typically search by subject. In general, they are quite satisfied with MEDLINE.

The results of the survey provide objective data on several key questions about online searching by individuals. NLM staff views about the system improvements most desired by individual users are generally corroborated by the users themselves. In general, individual users appear to have a very positive view of NLM's online service. This is evidenced by the high return rate of the survey and the willingness of a large majority of respondents to participate in follow-up studies, as well as by explicit indications of satisfaction.

Report on the Survey of Individual Users of MEDLINE on the NLM System

INTRODUCTION

The National Library of Medicine's basic mission is to improve the dissemination of information important to the progress of medicine and to public health. In support of this goal, NLM developed MEDLARS, an automated Medical Literature Analysis and Retrieval System, in the 1960's and was a pioneer in offering online retrieval services over nationwide telecommunications networks in the 1970's. MEDLINE, a file of indexed citations to articles in biomedical journals, was the first NLM database to be made available online and continues to be the most heavily used MEDLARS file, accounting for more than 75% of the over 4 million searches done annually.

For the first 20 years of its existence, MEDLARS was used principally by medical librarians who acted as search intermediaries for health professionals (both researchers and practitioners) who needed to locate pertinent information in the health sciences literature. To ensure that health professionals received good, cost-effective MEDLARS service, NLM required searchers to attend an online services training course as a condition of obtaining an access code for system use.

As more and more individual health professionals began to have access to personal computers, NLM took several steps to encourage these individuals to access NLM's databases directly as "end-users." These steps included: developing a special one-day course in searching MEDLINE for health professionals, training medical librarians throughout the U.S. to provide this course in their local settings, streamlining procedures for obtaining online access codes, making the system available around the clock, and developing a user-friendly microcomputer interface to the NLM system. On July 1, 1986, the training requirement was dropped entirely. As a result of these actions, the number of individual health professionals accessing MEDLINE directly on the NLM system has increased dramatically in the past three years and is continuing to grow at the rate of well over 200 users per month.

PURPOSE OF THE SURVEY

In order to provide a retrieval service that is both easy to use and effective, NLM needed more detailed information about this growing and important end-user population, their information needs, and their level of satisfaction with the present system, and with MEDLINE, the most frequently used database.

As a first step, the Library decided to survey the individual users of MEDLINE to obtain answers to the following questions:

1. What are the demographic characteristics of the health professionals (researchers and practitioners) who perform their own searches on MEDLINE on the NLM computer system?

2. How do these users enter the system (e.g., directly using the command language or via a microcomputer front-end) and why do they use that method?

3. For what purposes are they accessing the system (research, patient care, etc.)?

4. What is their level of satisfaction?

   (a) with the content of the material identified (e.g., relevance of citations, completeness of retrieval, data elements available)

   (b) with the search mechanism used

5. What changes or improvements would make the system more useful to them?

We hope to use the information gathered to identify system improvements that will provide a better level of information service to U.S. health professionals.

METHODOLOGY

Questionnaire Development

In the summer of 1986, a Study Team* was convened to determine what information was needed to answer these basic questions and how it might best be obtained. The Study Team began by outlining broad categories of interest (e.g., demographics, level of training, means of accessing the system, purpose of search, and level of satisfaction), and then formed subgroups to develop lists of questions within each of the categories. The Study Team developed a draft questionnaire that was circulated to other NLM staff for comment. With the assistance of a contractor, Market Dynamics, Inc., the preliminary questionnaire was restructured and reformatted. A pre-test was then conducted on a small group of individual users of MEDLINE on the NLM system. Following the pre-test, the questionnaire was revised again and sent to the Office of Management and Budget for review as required by the Paperwork Reduction Act. The final version of the questionnaire appears as Attachment 1.

Population Surveyed

The survey population was defined as individual "end-users" of MEDLINE on the NLM system. Since there was no reliable way to define sample strata, the decision was made to survey all individuals who had obtained access codes for use of NLM's online system in order to obtain as much richness in the data as possible. We were particularly interested in qualitative comments that individuals might provide in response to the open-ended questions. The only mechanism available to identify the target group was a classification system used by NLM's MEDLARS Management Section to process applications for online access codes. In cases of doubt, we erred on the side of being too inclusive, rather than restrictive, in deciding which classification codes to use.** As a result, the mailing included, as best we could determine, all domestic individual end-users of MEDLINE on the NLM system as of July 1987.

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*Members of the Study Team were: Patricia Buchan, Betsy Humphreys, Charles Kalina, Sheldon Kotzin, T. Scott Plutchak, Nancy Selinger, Elliot Siegel, John Starkweather, Carolyn Tilley, Karen Wallingford, and Rose Marie Woodsmall.

**Attachment 5 shows the classification categories and the numbers of individuals in each, and outlines the strategy used to define the survey population.

Instructions were included in both the cover letter and the follow-up letter for those who do not search MEDLINE themselves (i.e., who always have an intermediary search). They were asked to write across the top of the questionnaire that they do not search MEDLINE personally and to return the unanswered questionnaire to NLM. In cases in which they had begun filling out the questionnaire, they were instructed to stop at the bottom of page 2 after completing only the demographic questions. These individuals were not included in the data analyses.

Data Collection Procedures

The questionnaires, with a cover letter from the Director, National Library of Medicine (Attachment 2), were mailed to 4,311 individuals on October 2, 1987. A reminder postcard (Attachment 3) was sent to the entire survey population on October 14. Four weeks after the initial mailing, November 3, a follow-up letter (Attachment 4) and a duplicate copy of the questionnaire was mailed to those who had not yet responded. Returns were accepted until December 10, 1987.

Questionnaire Return Rates

The following table shows the questionnaire return rates:

Mailed	Returned	% Returned
4311		
-73*		
4238	2970	70.1%
-243*	-243**	
-11***		
3995	2716	Usable = 68.0%

* Undeliverable
** Ineligible because not individual users of MEDLINE
***Unanswered questionnaires returned by eligible individuals

The return rate is based on the number who actually received the questionnaire. The 73 undeliverable questionnaires were subtracted from the original number mailed on the assumption that they were no longer active individual users of MEDLINE. The 243 who identified themselves as non-users were also subtracted from the population. The 11 individuals who erroneously considered themselves as ineligible (because they use GRATEFUL MED) were, however, not subtracted from the survey population because they are individual users of MEDLINE on the NLM system. The usable return rate was thus calculated to be 68.0%.

Since the universe of individual MEDLINE users was surveyed, sampling error does not affect the results. Because the return rate was high, non-response bias is negligible. We believe the survey findings to be representative of all individual users of MEDLINE as of July 1987.

Data Analysis Procedures

Questionnaires that were returned to NLM by the individuals surveyed were in turn sent to the contractor, Market Dynamics, Inc. Market Dynamics was responsible for designing a database format to store the questionnaire data and for coding and keying the data, with the exception of some of the open-ended questions. Coding of open-ended responses that required technical knowledge of the NLM system was done by NLM staff. Market Dynamics used the SPSS statistical package for the data analyses. Frequency distributions were done for each of the questions and at the outset a number of cross-tabs were specified by NLM. As the data were examined, additional cross-tabs and t-tests were performed.

FINDINGS

The findings from the survey are presented in the following sections:

- Demographic Characteristics of Survey Respondents
  - General Searching Behavior
  - Characteristics of MEDLINE Searches
  - Opinions about the System
  - Access and Training
  - Comments on the System
  - Willingness to Participate in Follow-up Studies
  - Conclusions
  - Key Points

Unless otherwise noted, percentages are based on the number of respondents who answered the particular question; individuals who did not answer the question are not reflected in the percentages presented. The number of non-responses to each of the questions is shown in the tables.

On several questions, respondents were instructed to give more than one response, if appropriate. In these cases, percentages will sum to more than 100%.

Demographic Characteristics of Survey Respondents

Professions (Table 1)

Question 1 asked respondents to indicate their profession(s) by circling all that applied. 2,710 individuals (99.8% of the entire survey group) responded to the question. Nearly two-thirds identified themselves as physicians (65.5%) and more than a quarter (27.7%) as scientists. 482 individuals did indicate more than one profession; 286 (10.5%) said that they were both physicians and scientists. Thus, 82.7% of the respondents who indicated their profession are physicians or scientists, or both.

Nurses made up 3.7% of the respondent group. Another 6.6% said they were "other health professional." 7.6% listed their profession as "other." Included in this group were diverse professionals such as lawyers, statisticians, engineers, etc., but the numbers in the various "other" professions are too small to break out into separate categories. 4.4% said they were students. Although the survey was intended for the population of users who search MEDLINE as individuals ("end-users"), 3.2% of the respondents indicated that they were librarian/information specialists. Of these, 28% indicated

more than one profession: nine were also "other health professionals," four were physicians, four nurses, four "other," and three students.

Because the respondents were able to indicate more one than profession, the percentages total more than 100%.

Specialties (Table 2)

Question 4 asked the respondents who are health professionals to indicate their specialties. 2,197 (80.9% of the entire respondent group) answered this question. Those who responded are involved in a broad range of medical specialties. More than 40 specialties were listed, with some respondents indicating more than one specialty. The specialties listed most often are: internal medicine (282), medical oncology (147), pathology (125), and pediatrics (109). The full distribution of specialities is given in Table 2.

Education (Table 3)

Question 2 asked the respondents to indicate the highest degree held. The majority of the respondents hold either M.D. or Ph.D. degrees. 1,760 said that they hold M.D. degrees, and 570 hold Ph.D. degrees. Although the question asked for the highest degree (implying a single response), some respondents did list more than one degree.

Year Highest Degree Was Received (Table 4, 5)

Question 3 asked the respondents to indicate the year in which they received their highest degree. Of the group, 98.2% (2,667 individuals) answered this question. Answers spanned a range of 60 years, with one person receiving the highest degree in 1929, and one expecting a degree in 1989. The majority received their highest degree within the last 18 years: 40.1% during the 1970's and 27.1% in the 1980's. Thus, the majority of individual users of MEDLINE appear to be relatively young. Just under 20% (19.6%) received their highest degree in the 1960's and 10.1% in the 1950's. Only 3.1% received their highest degree prior to 1950.

Among the various professional groups, over half of the nurses (53.5%) and almost three-fourths of the students (72.8%) received their highest degrees in the 1980's.

Primary Work Place (Table 6, 7)

Question 5 asked respondents to indicate their primary work place by circling only one of the choices provided or by specifying an "other." Nearly the entire group (99.4%, 2,701 individuals) answered, almost half (46.8%) indicating they work in an academic setting (college, university, or medical school). The remaining respondents are split evenly among private/solo practice (12.6%), group practice (12.3%), and hospital/clinic (14.6%). Only 5.4% work in a government agency, and 3.3% in a private company or business. Nearly half of the physicians (49.7%) work in a clinical practice setting (group practice 17.7%, private/solo practice 16.6%, and hospital/clinic 15.4%). 40.4% work in academic settings.

Over three-fourths of the scientists work in academic settings. The largest percentage (45.8%) of the "other health professional" group also work in academic settings. Nurse respondents tend to work in either an academic setting (41.4%) or hospital/clinic setting (32.3%).

General Searching Behavior

Frequency of Searching

Question 8 asked the respondents to indicate the number of MEDLINE searches they do by themselves in the average month. 98.9% (2,686) of the respondents answered this question. More than two-thirds (68.6%) indicated that they do all searches by themselves. Half (52.7%) report that they perform two or fewer searches in the average month. Included in this group are the 12% who report that they don't perform any searches in the average month. These individuals were included in the usable respondent group because, while they may not perform any searches in the average month, they do occasionally search MEDLINE by themselves. More than a third (34.1%) perform 4 or more searches in the average month. Of the respondents who reported that they perform at least one search in the average month, the average number of searches performed is 4.3 searches per month.*

Question 9 asked respondents to indicate the number of searches they have someone else do for them in the average month. Again, 98.9% (2,686 individuals) answered the question. The majority (68.6%) entered a zero, indicating that they do all of their own searches. Of the one-third who at times have others perform searches for them, 15.1% have one search per month, 10.2% have 2-3 searches, and only 6.0% have 4 or more searches done by someone else in the average month. For those who have others perform searches for them, the average number is 2.5 per month.

Searches Performed by Others (Table 10-A/B, 11-A/B, 12, 13, 14)

Question 10 was a multi-part question that asked respondents who occasionally or always have someone else search for them to indicate: A) who generally does the searches; B) under what circumstances is it preferable to have someone else search; C) what is the level of satisfaction with searches done by self and by others; and D) if generally not satisfied with searches done by others, what are the reasons for dissatisfaction.

In response to the first part of the question, 1,103 individuals (40.6% of the entire respondent group) indicated that they at least occasionally have someone else perform searches for them. The majority (81.9%) of the searches performed by others are done by librarian/information specialists. Librarians tend be selected most frequently by those working in a government agency (89.7%), hospital/clinic (89.5%), group practice (89.4%), and private/solo practice (85.5%). Respondents in an academic setting have searches performed by student/research assistants (10.5%) and colleagues (6.7%), as well as librarians (74.1%).

In response to part B of the question, 1,151 individuals (42.4% of the entire respondent group) provided the reasons why they, at least occasionally, have someone else search for them. "When I don't have time to do it myself" was the most frequently cited reason for having someone else perform MEDLINE searches. 59.3% of the responses

*Because we were concerned that the few librarian/information specialists included in the respondent group might have inflated the average number of searches per month, we did some further analyses that excluded the librarian/information specialists. These analyses indicated that although the librarian/information specialists do perform far more searches (13.2) in an average month, they have a negligible effect on overall results. In addition, as noted earlier, over a quarter (28.0%) of the individuals who listed their profession as librarian/information specialist also indicated another profession.

indicated this reason. Slightly more than a third (38.7%) had someone else search when they needed different expertise or system knowledge. 27.5% had someone else search after they had tried a search and not been satisfied with the results. Respondents to this question were instructed to circle all that apply, and in this case percentages again exceed 100%.

1,121 individuals (41.3% of the entire respondent group) indicated their level of satisfaction with searches done for them by someone else on a scale of 1 (very satisfied) to 5 (not at all satisfied). 70.6% (819 individuals) expressed satisfaction with the results by indicating 1 or 2, 8.9% (100 individuals) are dissatisfied (responses of 4 or 5), and 20.5% (230 individuals) are neutral (response of 3).

Compared to the percentage of satisfied individuals from the respondent group as a whole, higher percentages of individuals in government (80.6%), private/solo practice (74.2%) and group practice (74.1%) reported being satisfied with searches done by others. Slightly lower percentages of individuals satisfied with searches done by others were found in academic (68.5%) and hospital/clinic settings (65.5%). Private business not only had the highest percentage of satisfied individuals (80.7%), but also the highest percentage of dissatisfied respondents (12.9%).

150 individuals indicated reasons for dissatisfaction with searches done by others. Respondents to this part of the question were instructed to circle all that applied, and as a result, percentages exceed 100%. Almost two-thirds of this group (62.0%) cited dissatisfaction with the results of the search. 39.3% stated that they have to wait too long for search results. "Other" was the next most frequent reason given for dissatisfaction (30.7%). The fourth most frequently listed reason was cost (24.0%).

Searches Performed by Respondents

Why individuals search (Table 15)

Question 11 asked respondents to circle all factors that influenced their decision to search MEDLINE themselves rather than having someone else search for them, and then to check the single most influential factor in their decision. 2,171 individuals (79.9% of the entire respondent group) answered this question; because multiple answers were allowed, percentages exceed 100%. Greater familiarity with the subject matter was selected by 83.1% of the respondents, and the ability to get results faster by 82.4%. Almost two-thirds of the respondents (65.5%) indicated enjoyment of searching as a factor. Nearly a third (31.6%) said that one of their reasons for searching by themselves is that it is more cost effective than using an intermediary. Only 14.7% cited lack of an intermediary as one of the reasons for doing their own searches.

2,074 individuals (76.4% of the entire respondent group) indicated a most influential factor. As the single most influential factor, respondents indicated greater familiarity with the subject matter than search intermediaries possess (47.9%) or the ability to get search results faster (32.2%). 7.5% indicated enjoyment of searching as the most influential factor in the decision to search for themselves.

Level of experience (Table 16, 17)

Question 12 asked respondents to indicate how experienced a user of online databases they considered themselves to be. Choices ranged from 1 (very experienced) to 4 (not at all experienced). 2,561 individuals (94.3% of the entire respondent group) answered this question. Less than 10% of the respondents felt themselves to be very experienced

users of online databases. The majority (84.5%) felt they were somewhat experienced or not very experienced. Less than 8% (7.2%) indicated that they were not at all experienced.

Pattern of use of MEDLINE (Table 18, 19, 20, 21, 22)

Question 13 asked respondents to indicate how long they have been searching MEDLINE using their own code. 2,509 (92.4% of the entire respondent group) individuals responded. Nearly two-thirds (63.1%) have had their codes for a year or less. Just under another third (27.0%) have had their codes between one and two years. Only 10.0% have had access codes for more than two years.

Individuals who always use command language to search have, on average, had their codes twice as long (1.54 years vs. 0.8 years) as those who always search using the GRATEFUL MED form screens.

Question 7 asked respondents to indicate how many people (including themselves) share their access code. Respondents were instructed to enter a "1" if they were the only person who uses the code. 2,661 individuals (98.0% of the entire respondent group) answered this question. Overall, the respondents do tend to be true individual users of the system with the majority (82.0%) indicating that they don't share a code with anyone else. 8.6% share a code with one other person and another 8.7% share a code with two or more people.

Question 14 asked respondents whether their use of MEDLINE has increased or decreased since they received their own access codes. 2,545 individuals (93.7% of the entire respondent group) answered this question. More than half (57.7%) said that their use has stayed the same. 30.0% indicated increased use and 12.3% said that their use has decreased.

Question 15 was an open-ended response question that asked individuals whose usage had either increased or decreased to indicate the reasons for the change. The two most cited reasons given by the 678 individuals who reported increased use: increased familiarity with the system and greater need. Decreased need and lack of time were the two reasons cited most frequently by the 288 individuals who indicated their use of MEDLINE had decreased.

Cost considerations (Table 23, 24)

Question 16 asked respondents to indicate how often cost considerations keep them from doing a MEDLINE search. 2,554 individuals (94.0% of the entire respondent group) responded. Cost seems not to be of overwhelming importance in individuals' use of MEDLINE on the NLM system. The majority (67.6%) indicated that cost considerations rarely (26.6%) or never (41.0%) keep them from performing a search. Almost one-fourth (23.1%) said that cost considerations occasionally keep them from searching. Only 9.3% reported that cost considerations frequently keep them from searching.

Those most constrained by cost considerations reported having no formal work place, with 46.1% of that group citing cost as a frequent or occasional constraint. Slightly over a third of those individuals in an academic (36.0%) or hospital/clinic (34.6%) setting said that cost was frequently or occasionally a consideration in searching.

Cost seems to be less of a consideration for those working in group practice, private business, and private/solo practice, than it is for those in academic and hospital/clinic settings. Under a third of those working in private business (20.6%), group practice (22.6%) and private/solo practice (27.4%) reported that cost considerations occasionally or frequently are constraints on searching.

Characteristics of MEDLINE Searches

General Search Purpose (Table 25, 26)

Question 18 was a multi-part question that asked respondents about their most typical reasons for searching MEDLINE.

2,556 individuals (94.1%) answered the first part of the question. Four-fifths (81.7%) of the respondents indicated they typically search MEDLINE to satisfy an immediate information need. The highest percentages in this category are found in group practice (88.3%), followed by those who indicated "other" work place (85.2%), private/solo practice (83.6%), and government agency (83.2%).

Ten percent of all respondents typically search for information to stay current in their field. Those in private business had the highest percentage (17.2%) indicating this as their typical reason for searching MEDLINE. People who indicated no formal work place (15.4%) and individuals in academic settings (12.6%) ranked second and third. Only 7-8% of those in private/solo or group practice or in a hospital/clinic are typically interested in searching for information in order to stay current in their fields.

Only 5% of all respondents indicated they typically search to learn about new areas. The highest percentage (6.6%) are individuals in a government agency; only 1.9% of those in group practice and "other" work places typically search to learn about new areas.

Type of Retrieval Desired (Table 27, 28, 29)

The second part of the question asked respondents to indicate the number of citations they typically wish to retrieve (all relevant or just a few relevant citations). 2,550 individuals (93.9%) responded. The majority (58.9%) wish to retrieve all relevant citations from a particular time period rather than just a few relevant citations. Among the various work place groups, the percentages of individuals who typically want to retrieve all relevant citations range from a high of 65.2% of those in academic settings to a low of 47.6% of those in group practice. Analyzed by primary area in which search information is used, the percentages of individuals interested in all relevant citations ranges from a high of 67.1% of those who most commonly use search information for research/testing purposes to a low of 49.8% of those who most commonly use search information for patient care.

Numbers of Citations (Table 30, 31, 32, 55)

The third part of question 18 asked respondents whether they typically retrieve too few citations, about the right number of citations, or too many citations. 2,510 individuals (92.4% of the entire respondent group) answered this part of the question. 61.1% of the respondents indicated that they typically retrieve about the right number of citations. When analyzed by work place, the groups with the highest percentages indicating retrieval of the right number of citations are: "other" work place (73.1%) and government agency (69.7%).

Overall, 15% of the respondents feel that they typically retrieve too few citations. The highest percentages choosing this response are found in private business (23.5%), private/solo practice (21.7%), and group practice (20.6%), even though almost half of the respondents in these same work places expressed interest in retrieving only a few relevant citations.

Just under a quarter (23.6%) of all respondents feel that they retrieve too many citations. A slightly higher percentage of those individuals in private business (27.1%) indicated this.

Over 70% of all respondents always use either the command language or GRATEFUL MED form screens (43.2% and 26.9%, respectively) to search MEDLINE. Of the individuals who always search using command language, 64.8% indicated that they typically retrieve the right number of citations, compared to 56.9% of the individuals who always use the GRATEFUL MED form screens.

A higher percentage of those who always search using GRATEFUL MED form screens retrieve too few citations compared to individuals who always search using command language (23.6% vs. 10.2%).

In contrast, 25.0% of the respondents who always search using command language indicated that they retrieve too many citations compared to 19.6% of the searchers who always use GRATEFUL MED form screens.

Relevance of Citations Retrieved (Table 33, 34)

The final part of question 18 asked respondents to indicate what percentage of the citations they typically retrieve are relevant to their inquiry. 2,399 individuals (88.3% of the entire respondent group) answered this portion of the question. More than half of all respondents (58.6%) feel that of the citations they typically retrieve, fewer than half are relevant. Analyzed by work place, an even higher percentage of those in group and private/solo practice feel this way (63.4% and 61.1%).

Of the group of respondents as a whole, 41.4% feel that half or more of the citations typically retrieved are relevant. Individuals working in "other" places (52%), private business (48.8%), government agency (47.3%), and those with no formal work place (45.5%) were slightly more inclined to report retrieving greater percentages of relevant citations.

Types of Searches Conducted (Table 35)

Question 19 asked respondents whether they most often search for an author, a journal title, or a subject. Instructions specified that only one choice should be circled. 2,552 individuals (94.0% of the entire respondent group) answered this question. 96.0% of the respondents said that they most often search for a subject. Only 3.2% indicated that they most often search for an author and less than 1% said that they most often search for a journal title.

Use of Information Retrieved (Table 36-A/B/C, 37, 38)

Question 20 asked respondents to rank the three primary areas in which they use MEDLINE search information (1 = most common, 2 = second most common, etc.).

Regardless of the rank assigned, the areas mentioned most frequently were the following: research/testing (71%), patient care (69.1%), and education (66%).

2,592 individuals (95.4% of the entire respondent group) assigned a rank of 1 to indicate the area in which search information is most commonly used. 45.8% ranked research/testing as the most common use, followed by 38.2% who indicated patient care as the most common use. Educational use was selected by 12.4%.

Of all individuals who listed research/testing as one of their uses of MEDLINE information, 61.5% indicated it as the most common use. Similarly, of all individuals who ranked patient care as one of their uses, 52.8% ranked patient care as the most common. In the area of education the results are very different: of the individuals who listed education as one of their uses of MEDLINE information, only 17.9% indicated it is their most common use.

Of the individuals in private/solo practice, over two-thirds (68.8%) indicated that their most common use of the information is for patient care. Similarly, 75.8% of those in group practice most commonly use MEDLINE information for patient care. One-half of those in a hospital/clinic setting indicated patient care as their most common use. In contrast, of the individuals in academic settings, two-thirds (66.9%) indicated their most common use of MEDLINE information is for research/testing purposes. Over half of the individuals in private companies/businesses and government agencies also indicated that their most common use is for research/testing (52.8% and 56.6%, respectively). Only about one-tenth of the individuals in private/solo practice (10.6%), group practice (8.5%), and academic settings (10.3%) listed educational purposes as their most common use of MEDLINE information. Higher percentages of individuals in hospital/clinic setting (19.2%) and private company/business (15.7%) indicated educational purposes as their most common use.

Of all respondents who listed patient care as their primary use of MEDLINE information, 40.8% always use command language to search while 31.6% always use the GRATEFUL MED form screens. Twice as many individuals who always use command language search for research/testing purposes as compared to GRATEFUL MED form screen users (45.6% vs. 23.1%). And far more of the respondents whose primary use of MEDLINE information is for management/administration purposes indicated that they always use command language compared to individuals who always use the form screens (60.7% vs. 10.7%). Similarly, of all respondents who use MEDLINE information for regulation purposes, 50% always use the command language vs. 12.5% who always use the GRATEFUL MED form screens.

Use of MeSH (Table 39, 40-A/B, 41)

Question 21 asked individuals to indicate how often they use MeSH terms when searching for specific subjects. Choices provided were: 1. Always, 2. Usually, 3. Occasionally, 4. Rarely, 5. Never. 2,544 individuals (93.7% of the entire respondent group) provided a response to this question. Over two-thirds of the respondents (67.7%) always use (24.1%) or usually use (43.6%) MeSH terms for searching for subjects in MEDLINE. 8.8% rarely and 5.1% never use MeSH. There is a similar distribution of responses to question 22 which asked respondents to indicate how useful they find the MeSH terms to be. The scale provided ranged from 1 (very useful) to 5 (not at all useful). 2,475 individuals (91.1% of the entire respondent group) provided an answer to this question. Two-thirds find MeSH terms very useful (26.7%) or useful (39.0%), while 7.8% say that they're not useful and 3.2% say they're not at all useful. The remaining 23.2% are neutral regarding the usefulness of the MeSH terms.

When considered by work place, 73.2% of those in group practice and 71.7% of those in a hospital/clinic tend to use MeSH. Correspondingly, higher percentages of individuals in group practice (70.0%) and hospital/clinic settings (73.3%) feel that MeSH terms are useful.

Among the few who indicated that they rarely or never use MeSH, the highest percentages are found in government agencies (20.6%) and in private business (19.5%). Higher percentages of the individuals in these same work places (government agencies 19.4% and private business 15.3%), along with individuals with no formal work place (16%) said that MeSH terms are not very or not at all useful.

A t-test was done to compare the individuals who always search using the command language (N=1,060) with the individuals who always search using the GRATEFUL MED form screens (N=653) with regard to their use of MeSH terms. The mean for the group of individuals who always search using the command language is 2.08, indicating that the individuals who always use the command language usually use MeSH terms to search, while the mean for the group who always search using the GRATEFUL MED form screens is 2.46 (p=.000), indicating that among these individuals MeSH terms are used less frequently in searching MEDLINE. These two groups were also compared on how useful they find the MeSH terms to be. In the group who always search using the command language and who answered question 22 (N=1,051), the mean is 2.14 indicating that they generally find MeSH terms to be useful, while for the group of individuals who always use GRATEFUL MED form screens (N=620), the mean is 2.26 ($p < .05$), indicating that these individuals, on average, think MeSH terms are useful, but less so than the group who search using the command language.

Question 23 was an open-ended question that asked those individuals who think MeSH terms are generally not useful or who never use MeSH to indicate why. Responses were provided by 454 individuals (16.7% of the entire respondent group). The two reasons given most frequently for not using MeSH are: unfamiliarity with MeSH (N=116) and that MeSH terminology is cumbersome to use (N=107). The next two most frequently given reason for not using MeSH is that "there are no terms in my area" (N=57), followed by "terms are too general" (N=49).

Length of Searches (Table 42)

Question 24 asked how long it typically takes to search MEDLINE for citations on a particular subject. 2,533 individuals (93.3% of the entire respondent group) answered this question. For almost two-thirds of the respondents (64.1%), a typical search takes less than 10 minutes. Another quarter (25.2%) typically take between 10-15 minutes to conduct a search. 10.7% typically take more than 15 minutes.

Question 25 then asked whether the time was too long, reasonable, or quicker than expected. 2,526 individuals (93.0% of the entire respondent group) answered this question. The majority of the respondents (89.1%) feel that the length of time to conduct a search is reasonable, including 5.7% who find it to be quicker than expected. Only 10.9% think it takes too long.

Opinions about the System

Level of Satisfaction with Searches (Table 43, 44)

Question 8 asked individuals to indicate on a scale of 1 (very satisfied) to 5 (not at all satisfied) how satisfied they are with searches they do themselves. 1,318 individuals (48.5% of the entire respondent group) answered this question. Almost three-quarters (72.5%) of these respondents are satisfied with searches they do for themselves. Compared to the group overall, higher percentages of those with no formal work place (90.0%), those in a government agency (79.3%), and those in an academic setting (76.5%) express satisfaction with searches they do themselves.

Just under ten percent (9.0%) say that they are not satisfied with searches they do for themselves. Those in private/solo practice (14.7%) had the highest rate of dissatisfaction with their own searches.

Overall Satisfaction with MEDLINE (Table 45, 46, 47)

Using a scale of 1 (very satisfied) to 5 (not at all satisfied), question 17 asked the respondents to rate their overall satisfaction with MEDLINE on the NLM system. 2,539 individuals (93.5% of the entire respondent group) answered this question. Overall, 81.4% of the respondents indicated satisfaction with MEDLINE. Only 4.1% indicated that they are not satisfied. The remainder are neutral, neither satisfied nor dissatisfied.

Analyzed by work place, the highest percentages of satisfied individuals are those with no formal work place (92.3%) and those working in a government agency (90.5%). The groups expressing the highest percentages of dissatisfaction are those in private/solo practice (6.7%) and group practice (5.8%).

Individuals who always use GRATEFUL MED form screens and individuals who always use the command language to search appear to be equally satisfied with MEDLINE (82.3% and 82.5% respectively). Similarly, 3.6% of the individuals who always use command language report being dissatisfied with MEDLINE compared to 3.5% of those who always use the GRATEFUL MED form screens.

Desirable Additions to MEDLINE (Table 48, 49, 50)

Question 26 asked respondents whether there are types of information that they would find valuable that they cannot routinely find in a MEDLINE citation. 60.8% of the respondents answered no, indicating that MEDLINE citations are acceptable in their current form. Individuals who answered yes to the question were then presented with a list of information types from which to choose. Respondents were instructed to circle all that would be valuable, and to check the single most valuable type of information.

Among the respondents who indicated that there are other types of information they would find valuable (N = 1,019, 37.4% of the entire respondent group), full text of articles was the overwhelming choice; 79.1% listed it as one of their choices and 65.2% as the single most valuable information to add to MEDLINE. Author address was the next most frequently mentioned (37.0%), with 11.2% of the respondents indicating it as the most valuable piece of information. 31.4% said that research design would be valuable, but only 7.9% chose it as the single most valuable. Similarly, 23.6% said they'd find dosage information valuable, but only 4.5% thought it would be the single most valuable type of information to add to MEDLINE citations.

When viewed by primary purpose of search (patient care, education, research/testing), just under two thirds of those primarily interested in patient care (64.0%, N=304) and education (62.4%, N=83) selected full text as most valuable as opposed to just under half of those interested in research/testing (48.0%, N=271). Dosage information was the next piece of information most frequently identified as most valuable by those with a primary interest in patient care (6.3%, N=30) and education (5.3%, N=30; tied with journal section); those interested in research/testing selected author address (16.1%, N=91). The piece of information which ranked third as most valuable was research design, chosen by 9.4% (N=53) of those interested in research/testing and 5.3% (N=25) of those in patient care.

Desirable Improvements to MEDLINE (Table 51, 52, 53)

Question 27 asked respondents to indicate the features or capabilities they would like to see added to MEDLINE by selecting from a list provided and to check the one feature they would most like to see. 2,139 individuals (78.8% of the entire respondent group) provided an answer to this question. 71.8% of the respondents indicated improved MEDLINE backfile searching and 69.2% want improved capabilities for printing citations.

These same two capabilities were chosen most frequently as the single most desired capabilities individuals would like to see added to the NLM system: 35.9% listed improved backfile searching as the most desired capability, and 27.9% chose improved capability for printing citations as the most desired.

Improved backfile searching and improved print capability were the overwhelming first and second choices irrespective of the respondents' typical purpose of search. Among the individuals who typically search for educational purposes, 32.2% indicated more "didactic" literature as one among the features they would like to have added to MEDLINE and 9.8% considered it the most desirable additional feature. In the group who typically search for patient care purposes, 21.5% listed more "didactic" literature among their choices for features to add to MEDLINE.

Individuals who always search using command language listed improved backfile searching (70.1%) and improved print quality (71.1) most frequently among all desired capabilities. Individuals who always search using GRATEFUL MED form screens also chose the same two features: backfile searching (63.8%) and printing (55.6%), although in smaller percentages.

Access and Training

Equipment (Table 54)

Question 6 asked whether individuals have microcomputers available in their work place. 2,708 individuals (99.7% of the entire respondent group) answered this question, 96.0% of them affirmatively. Question 28 then asked respondents to indicate whether they primarily use a microcomputer or a terminal to access MEDLINE. Of the 2,556 individuals (94.1% of the entire respondent group) who provided an answer, 96.0% said that they use a microcomputer, only 4.0% indicating that they use a terminal.

Command Language Searching vs. Use of GRATEFUL MED
(Table 55, 56, 57, 58)

Question 29 asked respondents to indicate the percent of MEDLINE searches they performed using various access methods. Instructions stated that the percent should add to 100 and that if a method was not used, respondents should enter a "0" in the blank provided. 2,474 individuals (91.1% of the entire respondent group) answered this question. 1,870 individuals (75.5% of those who answered the question) indicated that they always use a single method to access MEDLINE, almost half (43.2%) always using the command language, while over one-fourth (26.9%) always use the GRATEFUL MED form screens. Smaller percentages of individuals always use another front-end package (4.2%) or GRATEFUL MED direct option (1.8%). Only 604 individuals indicated that they use more than one method to access MEDLINE. Of these, 504 use GRATEFUL MED form screens some of the time, 359 use GRATEFUL MED direct option some of the time, 268 use command language some of the time, and 124 use another front-end package some of the time. The remainder of this Section presents data only on those individuals who either always search using the command language or who always search using the GRATEFUL MED form screens.

Higher percentages of students (50.5%), other health professionals (49.4%), nurses (47.6%), and scientists (46.6%) always use the command language to search than of physicians (39.7%). More of those reporting no formal work place (57.7%) or "other" work place (47.1%) always search using command language as compared to individuals in other specified work places.

A larger percentage of the physician group (30.1%) always uses the GRATEFUL MED form screens in comparison to the other professional groups ("other health professional" 24.8%, scientist 21%, nurse 18.5% and student 17.1%). One-third of the respondents in private/solo and group practice use GRATEFUL MED form screens all of the time.

A greater percentage of those who are younger (receiving degrees in the 1970's and 1980's) search MEDLINE using the command language, while a higher percentage of those receiving their degrees earlier search using the GRATEFUL MED form screens. Half of those receiving degrees in the 1980's indicated that they always search MEDLINE using the command language, whereas only 25.0% of those who received their highest degree before 1950 do so. The percent who search using command language increases as age decreases: only 41.2% of those receiving degrees before 1950 sometimes search using the command language, as opposed to 61.3% of those who received degrees in the 1980's. The reverse is true for use of the GRATEFUL MED form screens. 60.9% of those receiving degrees before 1950 use them at least some of the time, compared to 30.7% of those receiving degrees in the 1980's.

Difficulties Accessing MEDLINE (Table 59)

Question 31 asked respondents about the types of problems, if any, they have in accessing the NLM computer. 2,392 individuals (88.1% of the entire respondent group) provided an answer to this question. Respondents were instructed to circle all choices that applied. More than half of the respondents (53.8%) reported no problems in accessing the NLM computer. The most frequent problem encountered is busy telecommunications lines (19.5%).

Learning to Search MEDLINE (Table 60, 61-A/B, 62-A/B, 63-A/B, 64-A/B)

Question 32 asked individuals to indicate all the methods they used to learn to search MEDLINE on the NLM system, and to check the one method that was the most helpful. 2,203 individuals (81.1% of the entire respondent group) answered this question, with 2,059 individuals (75.8% of the entire respondent group) listing a method that they found most helpful. The most frequently mentioned methods were: NLM-sponsored training course (49.7%), using GRATEFUL MED (45.3%), and self-taught (45.0%). These same three methods were most frequently listed as most helpful: NLM-sponsored training (42.7%), use of GRATEFUL MED (31.3%), and self-taught (11.8%).

Among the individuals in both private/solo practice and group practice, GRATEFUL MED ranked first among the methods used to learn to search MEDLINE (52.2% and 51.2% respectively). Self-taught (44.3% and 44.5%) and attended NLM training (41.2% and 44.1%) were the next most frequently used methods by individuals in private/solo and group practice. Individuals in academic and hospital/clinic settings most frequently indicated that they attended NLM training (53.6% and 51.4%), followed by self-taught (43.8% and 45.9%), and used GRATEFUL MED (42.1% and 44.3%).

Among the individuals who always search using the command language, NLM training was most frequently (72.8%) listed as a method used to learn to search MEDLINE, followed by self-taught (44.4%), and taught by a co-worker (14.0%). In this group of individuals, NLM training was most frequently selected as the most helpful method by 68.5% of the respondents.

In the group of individuals who always search using the GRATEFUL MED form screens, GRATEFUL MED was by far the most frequently cited (93.1%) among all methods used to learn to search, followed by self-taught (38.7%) and NLM-sponsored training (17.7%). In this group, 82.2% selected GRATEFUL MED as the most helpful method in learning to search.

A t-test was done to compare the group of individuals who always search using the command language with those who always search using the GRATEFUL MED form screens in regard to whether they had attended either the 3-5 day training class offered by NLM or the 6-hour Basics of Searching MEDLINE course. 19.9% of the individuals who always search using the command language had attended the 3-5 day class compared to 2.7% of the individuals who search using GRATEFUL MED form screens. And twice as many individuals who always search using the command language attended a 6-hour Basics class compared to those individuals who always use the GRATEFUL MED form screens (29.7% vs. 14.7%).

Question 33 asked those respondents who had attended the 3-5 day training course and/or the 6-hour Basics of Searching MEDLINE course to indicate their level of satisfaction with the training. Again, the scale ranged between 1 (very satisfied) and 5 (not at all satisfied). Of those who said that they took the 3-5 day training course (328 individuals, 12.1% of the entire respondent group), 83.8% indicated that they were satisfied with the training. Less than 3% were dissatisfied. The rest were neutral. Satisfaction with training does relate to overall satisfaction with MEDLINE; 83.7% indicated that they are satisfied with both the training and with MEDLINE. Similarly, 2.8% indicated dissatisfaction with both the training and with MEDLINE. 13.6% were neutral on both.

Of those who took the 6-hour Basics of Searching MEDLINE course (1040 individuals, 38.3% of the entire respondent group), 83.5% were satisfied with the training they received. Less than 4% of this group indicated dissatisfaction. The rest were neutral. Again, satisfaction with training relates to overall satisfaction with MEDLINE; 83.7% indicated satisfaction with both the 6-hour course and with MEDLINE; 3.5% indicated dissatisfaction with both the training and with MEDLINE. 12.8% were neutral on both.

Comments on the System

Most Satisfactory Aspects (Table 65, 66)

Respondents were given space to comment on their perceptions of the most satisfactory aspects of MEDLINE. Comments were provided by 747 individuals (27.5% of the entire respondent group). Percentages are based on the number of individuals responding, rather than the number of aspects they cited. The most frequently cited aspect is the content of MEDLINE (32.7%). Hours and availability (25.4%) and speed and efficiency (24.6%) were the next most frequently mentioned. GRATEFUL MED (19.9%) was fourth on the list, followed closely by cost (18.7%).

Among the individuals who always search using the command language and who provided comments on the aspects they find most satisfactory (N=305, 11.2% of the entire respondent group), the following were most frequently cited: content of the database (39.8%), speed and efficiency (29.3%), hours and availability (27.6%), and cost (24.7%). Of those who always search using the GRATEFUL MED form screens and who provided comments on the most satisfactory aspects (N=194, 7.1% of the entire respondent group), the aspects most frequently cited are: GRATEFUL MED (45.9%), hours and availability (25.3%), content of the database (23.2%), and speed and efficiency (21.6%). Cost was mentioned by only 12.9% in this group. Again, because a single respondent may have indicated more than one aspect, percentages total to more than 100%.

Least Satisfactory Aspects (Table 67, 68)

Respondents were also given space to comment on aspects of MEDLINE that they considered to be least satisfactory. Comments on least satisfactory aspects were provided by 874 individuals (32.2% of the entire respondent group). Topping the list were GRATEFUL MED limitations (17.2%), backfile searching (14.0%), and MeSH vocabulary/indexing (13.7%).

Among those who always search using the command language, and who provided comments on the aspects they find least satisfactory (N=387, 14.2% of the entire respondent group), the aspects cited most frequently are: MeSH vocabulary/indexing (17.3%), command language searching (16.0%), printing (16.0%), and backfile searching (13.2%). "GRATEFUL MED not available for other types of microcomputers" was mentioned as a least satisfactory aspect by 12.9% of the command language users who provided comments.

In the list of least satisfactory aspects cited by individuals who always use GRATEFUL MED form screens (N=196, 7.2% of the entire respondent group) are: GRATEFUL MED limitations (37.2%), backfile searching (15.3%), and MeSH vocabulary/indexing (10.7%).

Willingness to Participate in Follow-Up Studies (Table 69)

86.1% of the 2,342 individuals (86.2% of the entire respondent group) who answered this question indicated that they would be willing to participate in follow-up studies, while only 13.9% declined. 374 individuals (13.8%) did not answer the question.

CONCLUSIONS

In the two years before the survey was conducted, NLM took two major steps to encourage individuals to search MEDLINE directly. The first was the establishment in 1985 of a program to train health professionals in the basics of searching MEDLINE on the NLM system. To support this program the Library developed a 6-hour course and trained medical librarians throughout the United States to teach it. The widespread availability of this short course led to the first sharp increase in the number of individual users of MEDLINE. About 25% of all survey respondents (27% of those who supplied the information) indicated that they obtained their codes during the first year the course was given, i.e., 13 to 24 months prior to July 1987.

The second step was the introduction in March 1986 of GRATEFUL MED, a PC software package that allows users without special training to search MEDLINE and other databases on the NLM computer. About 58% of all survey respondents (63% of those who provided the information) obtained their codes in the year after GRATEFUL MED was introduced, i.e., during the 12 months ending in July 1987. The survey data on methods used to learn to search MEDLINE and to access the database indicate that this tremendous 12-month increase in the number of individual code holders is due to the combination of the introduction of GRATEFUL MED and the continuing effects of the short courses in command language searching.

Overall, 40% of all respondents (49.7% of those who provided training information) indicated that they had taken an NLM sponsored training course and 49% (54.1% of those who answered the question) indicated that they always or sometimes used the command language. 37% (45.3% of those who supplied the information) stated that they had used GRATEFUL MED as one method for learning to search and 42% (47.4% of those who answered the question) indicated that they always or sometimes used GRATEFUL MED form screens when searching MEDLINE. As respondents could indicate multiple training methods and some use both the command language and GRATEFUL MED form screens to search, there is some overlap in these figures. Nonetheless, at the time the survey was taken there were slightly more individuals using command language to access NLM's system than were using GRATEFUL MED.

This situation has changed dramatically since July 1987. Of the more than 3,500 individuals who have obtained codes since the survey was taken, about 75% indicated that they intended to use GRATEFUL MED. In addition to the general increase in publicity for the software package, the emphasis in many of the search training courses provided by medical librarians has shifted from the command language to the use of GRATEFUL MED. In assessing the significance of the survey results, it is important to remember that individual command language searchers are now almost certainly a minority and that the percentage of individuals using the command language will probably continue to decrease.

While the split between command language and GRATEFUL MED searchers represented in the survey results can be viewed as a historical artifact, the data also reveal a more basic division of individual users into two different groups that can be

expected to persist. The first group is more heavily concentrated in academic settings, uses MEDLINE primarily in support of research, and is typically interested in comprehensive retrieval. Most of the people in this group are physicians or physician-scientists. At the time of the survey, higher percentages of individuals in academic settings had taken formal online search training and were using the command language as compared to individuals in other work settings. This is not surprising since to date the majority of the special short training classes have been given in academic settings.

The second group is made up predominantly of physicians who work in private/solo practice, group practice, or hospital or clinic settings. These individuals use MEDLINE primarily in support of patient care and are more likely (than "research" users) to wish to retrieve just a few relevant citations. At the time the survey was conducted, the majority of users in private/solo or group practice was already using GRATEFUL MED, and a higher percentage of users in hospitals or clinics was using GRATEFUL MED as compared to users in academic settings. Individuals in these settings were less likely to have access to the short courses in command language searching.

The lines between the "research" and "patient care" groups blur, particularly in the research hospital environment, and it is obvious that the same individual may be a "research" user and a "patient care" user at different times. Nevertheless, the survey data support the traditional view that there are two basic types of MEDLINE users and that they do look for different things from the system. At the time the survey was conducted, the "research" group was slightly larger than the "patient care" group. The the latter has much greater potential for growth, however, and can be expected to become the predominant group of individual users, if indeed it has not already become so. The survey results show that the percentage of new individual users coming from academic settings had been declining slowly during the 18 months prior to the survey, as the combined percentage of new users from patient care settings was increasing slowly.

Although more than half of both groups typically retrieve what they perceive as the "right number of citations," the survey revealed that retrieval of too few citations is perceived as a more frequent problem by "patient care" and GRATEFUL MED users than by "research" and command language users. This perception is supported by NLM system statistics showing that over 30% of GRATEFUL MED searches result in no retrieval. Analyses of system traffic files of GRATEFUL MED searches indicate that non-retrieval most frequently results from combining too many search terms together or through misunderstanding of basic indexing policy (i.e., that the most specific terms are assigned by indexers). This is probably due to the fact that fewer GRATEFUL MED users receive any formal online search training. The survey findings provide additional justification for NLM's efforts to provide some sort of automated assistance to users who have retrieved nothing in response to a GRATEFUL MED search.

Although the "research" and "patient care" groups have some key differences, they also share many attributes. Respondents in both groups appear to be relatively young, as evidenced by the fact that 67% of all respondents received their highest degree in the last 18 years.* Essentially all respondents have access to personal computers and use

*We compared the age distribution of physician respondents with the age distribution of all U.S. physicians as reported in a recent AMA survey (Physician Characteristics and Distribution in the U.S. 1987 edition. Chicago, Division of Survey and Data Resources, American Medical Association, 1987, p. 22). For purposes of comparison, we assumed that the "average" physician obtains the M.D. degree at age 26. This suggests that those who received their M.D. degree before 1950 are under-represented among MEDLINE access codes holders, while those who received their M.D. degree in the 1960's or 1970's are disproportionately more numerous in the NLM sample than in the U.S. physician population as a whole.

them to perform MEDLINE searches. The majority do all their own searches, although this amounts to only a few searches in the average month. Most cite greater familiarity with the subject or the ability to get search results faster as the principal reason they search for themselves. Overwhelmingly they typically use MEDLINE to satisfy immediate information needs, rather than to stay current in their fields or to learn about new areas. They also typically search for subjects rather than authors or journal titles. Overall, they are quite satisfied with MEDLINE, although the majority think that fewer than half the citations they retrieve are relevant. Use of features such as starred terms and subheadings can help to exclude irrelevant citations, but analyses of the system traffic files show that these features are rarely used by individual users. Additional improvements to GRATEFUL MED and the development of the COACH expert search assistant should therefore focus on the problem of refining searches to reduce irrelevant retrieval.

Most respondents are satisfied with the types of information currently available in MEDLINE citations, and provided no data on additional information they would like to find in the file, even though full-text of articles was one of the choices presented. Of the 40% who thought that additional types of information would be useful, nearly two-thirds did indicate that the full text of articles would be the single most useful addition. Although only a minority of both groups mentioned full text, a greater percentage of the "patient care" group is interested in full text than of the "research" group, who tend to be in academic settings with better access to the literature. Again, not surprisingly, more members of the "research" group than of the "patient care" group listed author's address as the single most valuable addition to the MEDLINE record. As of January 1988, the principal author's address is carried in MEDLINE records.

The majority of respondents did indicate some features or capabilities (as opposed to information) that would be useful enhancements to MEDLINE. Those respondents who specified any desirable improvements generally agree on the principal features or capabilities they would like to see added to the NLM system. These are improved MEDLINE backfile searching and improved capabilities for printing citations. As might be expected, improved print capabilities were of greatest interest to command language searchers. Here the survey findings corroborate the opinions of NLM staff. Prior to the survey, work had been initiated to improve backfile searching capabilities in GRATEFUL MED. GRATEFUL MED users can now indicate at the beginning of a search that they wish to search MEDLINE and the backfiles or they can perform a backfile search without first searching MEDLINE. These changes were among others introduced in Version 3.0 which was mailed to users early in 1988. Also prior to the survey, improvements were planned for backfile search capabilities for command language searchers. A multi-file search capability was implemented in late 1988. An improved print capability was implemented for command language searchers in November 1987.

About 70% of the respondents did not provide any free form comments on the most and least satisfactory aspects of MEDLINE. 27% of the respondent group (n=747) provided a total of 1,260 comments on the most satisfactory aspects of MEDLINE. The pattern of comments was very different for command language searchers and GRATEFUL MED users. Command language searchers mentioned the content of MEDLINE most frequently, followed in order by the speed and efficiency of the system, its hours and availability, and cost. The appreciation for the content of MEDLINE is gratifying, considering the resources NLM devotes to selecting the contents and ensuring the quality of the database. The MEDLINE database is available from a variety of commercial online vendors, and in CD-ROM products, however, so it does not represent a particular incentive to use the NLM system. NLM's

system also does not differ appreciably from those of other online services in terms of speed or accessibility. The widespread availability of short training courses in the use of the NLM system and relative cost are probably the factors that led these command language searchers to choose NLM's system over other alternatives.

For GRATEFUL MED searchers who provided comments, convenience appears to be primary. GRATEFUL MED itself, which can only be used on NLM's system, is mentioned most frequently, followed in rank order by hours and availability, content, and speed and efficiency. Cost is mentioned much less frequently by GRATEFUL MED users. Older respondents are much more likely to use GRATEFUL MED than the command language, another indication that it is attractive to people with relatively little previous exposure to computers. These data support the view that GRATEFUL MED is making online searching attractive to people who previously thought it too inconvenient, time-consuming and cumbersome.

31% of respondents (n=874) provided a total of 1,218 comments about the least satisfactory aspects of the system. Again, there were substantial differences between command language searchers and GRATEFUL MED users. The least satisfactory aspect mentioned most frequently by command language searchers was MeSH vocabulary/indexing (by 17.3% of those commenting), followed by command language searching itself (16.0%), printing citations (16.0%), and backfile searching (13.2%), and the fact that GRATEFUL MED is currently available for IBM-compatible micros only (12.9%). This list matches the Library's view of the principal difficulties with command language searching by individuals. Solving problems caused by a lack of understanding of MeSH and indexing principles is a major objective of NLM's Unified Medical Language System (UMLS) project. GRATEFUL MED was developed to obviate the need for health professionals to learn the command language. As mentioned previously, NLM has also taken steps to improve printing and backfile capabilities. A MacIntosh version of GRATEFUL MED will be available in 1989.

The small percentage of GRATEFUL MED searchers who provided comments on the least satisfactory aspects mentioned specific limitations of the GRATEFUL MED package most frequently (37.2%), followed by backfile searching (15.3%), and MeSH vocabulary/indexing (10.7%). It should be noted that the survey was conducted before the introduction of Version 3.0 of GRATEFUL MED which incorporated many of the desired changes. Also, many of the individuals who cited GRATEFUL MED software limitations as a least satisfactory aspect also listed GRATEFUL MED as the most satisfactory aspect of the system. Thus, it seems that GRATEFUL MED users are generally quite satisfied with the software, but would like to have continued improvements made in its capabilities.

The results of this survey provide some objective data on key aspects of individual search behavior that have been discussed and debated since the introduction of online systems. There has been speculation about whether individuals would stop doing their own searching after the novelty wore off. The overwhelming majority of the respondents to this survey indicated that their use of MEDLINE had remained the same or increased since they obtained their online codes. As most respondents had obtained their codes within the year prior to the survey it will be interesting to see whether this pattern continues. The likelihood of continued use is increased by the fact that the overwhelming majority of survey respondents indicated that they typically search for immediate information needs rather than to stay current in their field or to learn about new areas. This is the case irrespective of whether respondents use the information for research or patient care purposes. It suggests that these individuals are integrating at least a modest amount of online searching into their regular work habits.

Another topic of discussion is whether the opportunity for direct online searching would attract new users or simply alter the mode of access of previous users of search intermediary services. The fact that two-thirds of the survey respondents do all their own searches suggests that new users are being attracted by the convenience of direct online searching. This view is supported by recent evaluations of MEDLINE CD-ROM products which also indicate that each new form of access to MEDLINE attracts some people who previously did not use the system in any form.

Controlled vocabularies, and the disparities among them, are often cited as barriers to effective use of online systems by individuals users. Over two-thirds of the respondents to the survey indicated that they always or usually use MeSH terms when searching for subjects in MEDLINE. A similar percentage find MeSH terms very useful or useful. The high rate of use of MeSH is a logical consequence of the percentage of respondents who had attended at least a 6-hour course in MEDLINE searching and the fact that GRATEFUL MED assists the user in locating appropriate MeSH terms. NLM's continuing efforts to improve and expand the MeSH cross-reference structure have also made the terminology more accessible to those without extensive search training. It appears that individual users are willing to use at least a single controlled vocabulary if such use is made relatively easy for them.

There has been considerable debate on whether (and how much) individuals would be willing to pay for direct online searching. About two-thirds of the respondents to the survey indicated that cost considerations rarely or never keep them from doing a MEDLINE search. Less than 10% reported that cost considerations frequently keep them from searching. Cost seems to be even less of a consideration for those in group practice and private/solo practice than for those in academic and hospital settings. These data (plus the continuing growth in the numbers of individual users that NLM has experienced since the survey was conducted) indicate that the current cost of searching MEDLINE on NLM's system is acceptable to many individuals.

While the survey provided new and interesting information related to online searching by individuals, it also provided objective data to support previously held opinions about these users and their views of the NLM system. In particular, NLM staff views about the system improvements most desired by individual users are generally corroborated by the users themselves. It is encouraging that enhancements recently implemented or planned by the Library will address several of these users' concerns with present system features. In general, respondents to the survey appear to have a very positive view of NLM's online service. This is evidenced not only by their explicit indications of satisfaction with MEDLINE but also by the high return rate of the survey and by the willingness of the large majority of the respondents to participate in follow-up studies.

The respondents to the survey represent relatively early adopters of direct online searching. Included in the survey population are: 1) the very small number of individuals who were willing to take the extensive training offered to search intermediaries in the earlier days of online retrieval; 2) the much larger group who were willing to take a 6-hour training course when it began to be offered in 1985; and 3) another substantial group who were the first individuals to decide that GRATEFUL MED made direct online searching practical and convenient for them. The continued growth in the number of individual GRATEFUL MED users since the time the survey was conducted suggests that there is a large pool of people who will find direct online searching feasible and attractive when they are made aware of the technology currently available. It remains to be seen whether these later adopters of direct online searching will differ in significant ways from the users described in this survey.

Key Points

1. Nearly two-thirds of respondents identified themselves as physicians (65.5%) and more than a quarter (27.7%) as scientists.

   - o Respondents were instructed to circle all professions that applied and 10.5% indicated that they were both physicians and scientists.

2. The majority of individual users of MEDLINE appear to be relatively young.

   - o The majority received their highest degree within the past 18 years:

     - 40.1% during 1970's
     - 27.1% during 1980's

3. More than two thirds of respondents (68.6%) indicated they do all searches by themselves.

   - o On average, they perform 4.3 searches/month by themselves.

4. Lack of time was the most frequent reason given for having someone else perform MEDLINE searches (by 59.3% of those who have others search for them)

5. The two main reasons given for performing their own searches were:

   - o greater familiarity with subject matter (47.9%)
   - o ability to get search results faster (32.2%)

6. Among all reasons selected (regardless of rank assigned), two-thirds of the respondents (65.5%) indicated enjoyment of searching as a factor.

7. The majority of respondents have had their codes for two years or less (90.1%). The majority of the respondents also do not share their code with anyone else (82%).

8. The majority of respondents (84.5%) feel they are somewhat experienced or not very experienced in the use of online databases.

9. For over half of all respondents (57.7%), online usage has remained about the same since receiving their access codes.

   - o 30% indicated usage has increased
   - o 12.3% indicated usage has decreased

10. Cost seems not to be of overwhelming importance in individuals' use of MEDLINE. The majority (67.6%) indicated that cost considerations rarely (26.6%) or never (41.0%) keep them from performing a search.

11. The overwhelming majority (96.0%) say they most often search for a subject. 81.7% indicated they typically search to satisfy an immediate information need.

12. Those whose primary use of MEDLINE search information is in research/testing are more likely to want all relevant citations (67.1%) compared to those whose primary use of MEDLINE search information is in education (53.3%) or patient care (49.8%).

13. Those in group and private/solo practice are somewhat more likely to feel that less than half of the citations they typically retrieve are relevant. (63.4% of those in group practice and 61.1% of those in private/solo practice compared to 58.6% of all respondents.)

14. Almost two-thirds of all respondents (60.8%) indicated MEDLINE citations are acceptable in their current form (i.e., answered "NO" to additional information needed in a citation).

- o of the 39.2% who said additional types of information would be valuable, full text was overwhelmingly chosen as the single most valuable piece of information not presently available in MEDLINE citations.

15. Eighty percent of respondents expressed an overall satisfaction with MEDLINE.

- o Individuals also are satisfied with their chosen method of accessing MEDLINE

16. Two-thirds of the respondents (64.1%) took less than 10 minutes on a typical search.

- o majority of respondents (83.4%) feel that length of time to conduct a search on MEDLINE is reasonable.

17. Of the group of individuals who indicated research/testing as one of their uses of MEDLINE information, 61.5% ranked it as their most common use. Of those who indicated patient care, 52.8% ranked it as the most common use.

18. A somewhat larger portion of the physician group (30.1%) always use GRATEFUL MED form screens as compared to the other professional groups (other health professional 24.8%, scientist 21%, nurse 18.5% and student 17.1%).

- o one third of respondents in private/solo and group practice always use GRATEFUL MED form screens to search.

TABLE 1

PROFESSION OF RESPONDENTS

N = 2710

	Frequency	Percent*
Physician	1776	65.5%
Nurse	99	3.7%
Other Health Professional	180	6.6%
Scientist	753	27.8%
Student	118	4.4%
Librarian/Info Specialist	86	3.2%
Other*	207	7.6%
Total	3219	
No answer:	6	

*Although 2710 individuals answered this questions, some indicated more than one profession; therefore, the frequency column is greater than 2710 and the percent column exceeds 100%.

Table 2
Specialty of Survey Respondent

N = 2197*

Specialty of Respondent	Frequency	% of Cases
Internal Medicine	282	12.8
Medical Oncology	147	6.7
Pathology	125	5.7
Pediatrics	109	5.0
Family Practice	99	4.5
Surgery	95	4.3
Psychiatry	85	3.9
Cardiovascular Disease	75	3.4
Hematology	64	2.9
Anesthesiology	58	2.6
Radiology	56	2.5
Dermatology	53	2.4
Neurology and/or Child Neurol.	53	2.4
Pulmonary Disease	51	2.3
Obstetrics and Gynecology	50	2.3
Gastroenterology	44	2.0
Ophthalmology	44	2.0
Endocrinology and Metabolism	40	1.8
Infectious Disease	39	1.8
Orthopaedic Surgery	35	1.6
Neurological Surgery	29	1.3
Emergency Medicine	25	1.1
Nephrology	22	1.0
Psychiatry and Neurology	21	1.0
Allergy	20	0.9
Urology	18	0.8
Rheumatology	16	0.7
Pediatric Hematology-Oncology	13	0.6
Pediatric Endocrinology	11	0.5
Physical Medicine and Rehab.	10	0.5
Neonatal-Perinatal Medicine	8	0.4
Pediatric Nephrology	8	0.4
Nuclear Medicine	7	0.3
Otolaryngology	7	0.3
Plastic Surgery	7	0.3
Preventive Medicine	6	0.3
Thoracic Surgery	6	0.3
Pediatric Cardiology	5	0.2
Colon and Rectal Surgery	4	0.2
Blood Banking	3	0.1
Child Psychiatry	1	0.0
Other	469	21.3
Total	2320	
No answer:	572	

*Some respondents indicated more than one specialty; therefore, precent exceeds 100 and frequency exceeds N of 2197.

TABLE 3

HIGHEST DEGREE RECEIVED

N=2733**

	Frequency*	% of Cases
M.D.	1760	64.4
Ph.D.	570	20.9
Masters	222	8.1
Bachelor's	149	5.5
Pharm.D.	39	1.4
Nursing	33	1.2
Dentistry	30	1.1
D.O.	23	.8
Other Doctorate	21	.7
Other	17	.6
DVM	15	.5
High School	9	.3

* This question allowed for multiple responses.
**The total number of respondents exceeds 2716 because this question was answered by some individuals who were later determined to be ineligible and were then excluded from further computations.

TABLE 4

YEAR RECEIVED HIGHEST DEGREE

N=2667

	Frequency	Percent	Cumulative Percent
Pre-1950	83	3.1	3.1
1950s	270	10.1	13.2
1960s	523	19.6	32.8
1970s	1069	40.1	72.9
1980s	722	27.1	100.0
Total	2667		
No answer:	49		

TABLE 5

**PROFESSION*
BY
YEAR HIGHEST DEGREE RECEIVED**

	Physician (n=1776)	Nurse (n=99)	Other Health Professional (n=180)	Scientist (n=753)	Student (n=118)	Librarian/ Info Spec. (n=86)	Other (n=207)	**Row Total**
Pre-1950	71	--	1	18	--	2	5	97
n=83	4.0%		.6%	2.4%		2.4%	2.6%	3.1%
1950s	224	2	7	72	1	2	13	321
n=270	12.8%	2.0%	4.0%	9.7%	.9%	2.4%	6.7%	10.1%
1960s	378	6	23	156	5	9	44	621
n=523	21.5%	6.1%	13.0%	21.0%	4.4%	10.8%	22.6%	19.6%
1970s	707	38	76	307	25	36	72	1261
n=1069	40.3%	38.4%	42.9%	41.3%	21.9%	43.4%	36.9%	40.1%
1980s	376	53	70	190	83	34	61	867
n=722	21.4%	53.5%	39.5%	25.6%	72.8%	41.0%	31.3%	27.1%
Column Total	1756	99	177	743	114	83	195	3167*
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
No answer	20	0	3	10	4	3	12	

*The number of respondents for each profession is based on a question which allowed multiple responses; therefore, the grand total of 3167 is greater than our population of 2716. The cross tab is based on two sets of data with different N's. The n's reported here reflect the # of responses to the individual question.

TABLE 6

PRIMARY WORKPLACE OF RESPONDENTS

N=2701

	Frequency	Percent	Cumulative Percent
Private/Solo Practice	340	12.6	12.6
Group Practice	331	12.3	24.8
Hospital/Clinic	395	14.6	39.4
College/Univ. Medical School	1264	46.8	86.3
Private Company/ Business	89	3.3	89.6
Government Agency	145	5.4	94.9
No Formal Workplace	28	1.0	96.0
Other Workplace	109	4.0	100.0
No answer:	15		

TABLE 7

PROFESSION* BY PRIMARY WORKPLACE

	Physician (n=1776)	Nurse (n=99)	Other Health Professional (n=180)	Scientist (n=753)	Student (n=118)	Librarian/ Info Spec. (n=86)	Other (n=207)	Row Total
Private/Solo Practice n=340	295 16.6%	3 3.0%	16 8.9%	12 1.6%	--	5 5.9%	28 13.7%	359 12.6%
Group Practice n=331	314 17.7%	6 6.3%	7 3.9%	6 .8%	2 1.7%	2 2.4%	6 2.9%	343 12.3%
Hospital/Clinic n=395	273 15.4%	32 32.3%	44 24.6%	34 4.5%	17 14.5%	24 28.2%	28 13.7%	452 14.6%
Coll/Univ/Med School n=1264	717 40.4%	41 41.4%	82 45.8%	602 80.3%	79 67.5%	14 16.5%	80 39.2%	1615 46.8%
Private Company/ Business n=89	21 1.2%	3 3.0%	14 7.8%	31 4.1%	1 .9%	11 12.9%	21 10.3%	102 3.3%
Government Agency n=145	102 5.8%	2 2.0%	4 2.2%	48 6.4%	1 .9%	4 4.7%	12 5.9%	173 5.4%
No Formal Workplace n=28	4 .2%	5 5.1%	3 1.7%	--	16 13.7%	6 7.1%	6 2.9%	40 1.0%
Other Work Place n=109	47 2.7%	7 7.1%	9 5.0%	17 2.3%	1 .9%	19 22.4%	23 11.3%	123 4.0%
Column Total	1773 100.0%	99 100.0%	179 100.0%	750 100.0%	117 100.0%	85 100.0%	204 100.0%	3207 100.0%
No answer	3	0	1	3	1	1	3	

*The number of respondents for each profession is based on a question which allowed multiple responses; therefore, the grand total of 3207 is greater than our population of 2716. The cross tab is based on two sets of data with different N's. The n's reported here reflect the # of responses to the individual question.

TABLE 8

OF SEARCHES PERFORMED BY RESPONDENTS IN A TYPICAL MONTH

N=2686

	Frequency	Percent	Cumulative Percent
None	323	12.0	12.0
One	570	21.2	33.2
Two	523	19.5	52.7
Three	355	13.2	65.9
Four	249	9.3	75.2
Five	242	9.0	84.2
Six or more	424	15.8	100.0
Total	2686		
No answer:	30		

TABLE 9

OF SEARCHES PERFORMED BY OTHERS
IN A TYPICAL MONTH

N=2682

	Frequency	Percent	Cumulative Percent
None	1842	68.6	68.6
One	405	15.1	83.7
Two	197	7.3	91.0
Three	78	2.9	93.9
Four	54	2.0	95.9
Five	55	2.0	98.0
Six or more	55	2.0	100.0
Total	2682		
No answer:	30		

TABLE 10-A

OTHERS WHO PERFORM SEARCHES

N=1103

	Frequency	Percent	Cumulative Percent
Librarian/Info. Specialist	903	81.9	81.9
Student/Research Assistant	58	5.3	87.1
Secretary/ Admin. Assist.	40	3.6	90.8
Colleague	51	4.6	95.4
Family Member	16	1.5	96.8
Other	35	3.2	100.0
Total	1103		
No answer:	1613*		

*Note that not all respondents were eligible to answer this question since many never used a search intermediary.

TABLE 10-B

OTHERS WHO PERFORM SEARCHES
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
Librarian/ Info Spec	118 85.5%	144 89.4%	352 74.1%	170 89.5%	26 83.9%	61 89.7%	4 80.0%	27 81.8%	902 81.9%
Student/ Res Assn	2 1.4%	2 1.2%	50 10.5%	--	1 3.2%	2 2.9%	--	--	57 5.2%
Secretary/ Admin Assn	6 4.3%	5 3.1%	17 3.6%	8 4.2%	1 3.2%	--	--	3 9.1%	40 3.6%
Colleague	2 1.4%	5 3.1%	32 6.7%	5 2.6%	1 3.2%	4 5.9%	1 20.0%	1 3.0%	51 4.6%
Family Member	1 .7%	3 1.9%	6 1.3%	4 2.1%	1 3.2%	1 1.5%	--	--	16 1.5%
Other	9 6.5%	2 1.2%	18 3.8%	3 1.6%	1 3.2%	--	--	2 6.1%	35 3.2%
Column Total	138 100.0%	161 100.0%	475 100.0%	190 100.0%	31 100.0%	68 100.0%	5 100.0%	33 100.0%	1101 100.0%
No answer	202	170	789	205	58	77	23	76	

TABLE 11-A

REASONS FOR HAVING OTHERS SEARCH MEDLINE

N=1151

	FREQUENCY	PERCENT*
When someone else can do it as easily as I can	220	19.1%
When I don't have time to do it myself	682	59.3%
When I need different expertise/ system knowledge	445	38.7%
When my search results have not been satisfactory	317	27.5%
Other	137	11.9%
Total	1801	
No answer	1565	

*Respondents were instructed to circle all reasons that applied; therefore, percentages total to more than 100% and frequencies total more than the N of 1151.

TABLE 11-B

REASONS TO HAVE OTHERS SEARCH
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)
When someone else can do it as easily as I can	25 17.2%	38 23.5%	99 19.8%	33 16.8%	7 21.9%	11 15.3%	--	6 17.1%
When I don't have time to do it myself	84 57.9%	104 64.2%	280 56.0%	133 67.9%	18 56.3%	39 54.2%	5 71.4%	18 51.4%
When I need different expertise/system knowledge	46 31.7%	67 41.4%	198 39.6%	68 34.7%	18 56.3%	30 41.7%	3 42.9%	14 40.0%
When my search results have not been satisfactory	41 28.3%	54 33.3%	126 25.2%	53 27.0%	15 46.9%	17 23.6%	2 28.6%	9 25.7%
Other	18 12.4%	11 6.8%	66 13.2%	19 9.7%	4 12.5%	14 19.4%	--	4 11.4%
Total Respondents	145	162	500	196	32	72	7	35
No answer	195	169	764	199	57	73	21	74

*Respondents were asked to circle all reasons which applied; therefore, percentages exceed 100 and frequencies exceed number of total respondents for each column.

TABLE 12

SATISFACTION WITH SEARCHES DONE BY OTHERS

N=1121

Satisfied	Frequency	Percent	Cumulative Percent
1	383	34.2	34.2
2	408	36.4	70.6
Neutral			
3	230	20.5	91.1
Dissatisfied			
4	86	7.7	98.8
5	14	1.2	100.0
Total	1121		
No answer:	1595*		

*Note that not all respondents were eligible to answer this question, since many never used a search intermediary.

TABLE 13

REASONS FOR DISSATISFACTION
WITH SEARCHES DONE BY OTHERS

N=150

	FREQUENCY	PERCENT*
Inconvenient location	17	11.3%
Inconvenient hours	24	16.0%
Have to wait for search	59	39.3%
Cost	36	24.0%
Unsatisfactory results	93	62.0%
Other	46	30.7%
Total	150	
No answer	2566	

*Respondents were instructed to circle all reasons that applied; therefore, percentages exceed 100% and frequencies are greater than the N of 150. Note that not all respondents were eligible to answer this question since many never used a search intermediary.

TABLE 14

SATISFACTION WITH SEARCHES DONE BY OTHERS
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
Satisfied									
1	54 40.9%	60 38.0%	151 30.6%	63 32.3%	11 35.5%	30 41.7%	1 25.0%	11 33.3%	381 34.0%
2	44 33.3%	57 36.1%	187 37.9%	65 33.3%	14 45.2%	28 38.9%	1 25.0%	12 36.4	408 36.5%
Neutral									
3	25 18.9%	28 17.7%	114 23.1%	45 23.1%	2 6.5%	9 12.5%	1 25.0%	6 18.2%	230 20.6%
Dissatisfied									
4	7 5.3%	11 7.0%	36 7.3%	19 9.7%	3 9.7%	5 6.9%	1 25.0%	4 12.1%	86 7.7%
5	2 1.5%	2 1.3%	6 1.2%	3 1.5%	1 3.2%	--	--	--	14 1.3%
Column Totals	132 100.0%	158 100.0%	494 100.0%	195 100.0%	31 100.0%	72 100.0%	4 100.0%	33 100.0%	1119 100.0%
No answer	208	173	770	200	58	73	24	76	

TABLE 15

FACTORS WHICH INFLUENCE INDIVIDUALS TO DO THEIR OWN SEARCHING

	N=2171		N=2074**	
	INFLUENTIAL FACTOR		MOST INFLUENTIAL FACTOR	
	FREQUENCY	PERCENT*	FREQUENCY	PERCENT
More familiar with subject than intermediary	1805	83.1%	994	47.9%
I get the information faster	1788	82.4%	667	32.2%
I enjoy searching	1423	65.5%	156	7.5%
More cost effective than intermediary	687	31.6%	62	3.0%
No intermediary was available	319	14.7%	96	4.6%
Other	129	5.9%	99	4.8%
Total	6151		2074	100.0%

*Multiple reasons were allowed. Total % exceeds 100% and frequency exceeds N of 2171.

**Not all respondents indicated a most influential factor.

TABLE 16

EXPERIENCE WITH ONLINE DATABASES

N=2561

	Frequency	Percent	Cumulative Percent
Very Experienced	212	8.3	8.3
Somewhat Experienced	1244	48.6	56.9
Not Very Experienced	920	35.9	92.8
Not Experienced	185	7.2	100.0
Total	2561		
No answer:	155		

TABLE 17

EXPERIENCE WITH ONLINE DATABASES
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
Very Experienced	34 10.8%	19 6.1%	78 6.5%	34 9.2%	15 17.2%	14 10.2%	3 11.5%	14 13.0%	211 8.3%
Somewhat Experienced	128 40.6%	137 43.9%	644 53.7%	160 43.5%	43 49.4%	69 50.4%	12 46.2%	47 43.5%	1240 48.6%
Not very Experienced	121 38.4%	128 41.0%	418 34.8%	138 37.5%	26 29.9%	41 29.9%	7 26.9%	39 36.1%	918 36.0%
Not Experienced	32 10.2%	28 9.0%	60 5.0%	36 9.8%	3 3.4%	13 9.5%	4 15.4%	8 7.4%	184 7.2%
Column Totals	315 100.0%	312 100.0%	1200 100.0%	368 100.0%	87 100.0%	137 100.0%	26 100.0%	108 100.0%	2553 100.0%
No answer	25	19	64	27	2	8	2	1	

TABLE 18

LENGTH OF TIME HAVE HAD MEDLINE CODE

N=2509

	Frequency	Percent	Cumulative Percent
6 Months or less	808	32.2	32.2
7 to 12 Months	776	31.0	63.1
13 to 18 Months	212	8.4	71.6
19 to 24 Months	464	18.5	90.1
25 to 30 Months	47	1.9	91.9
31 to 36 Months	114	4.6	96.5
37 to 42 Months	10	.4	96.9
More than 42 Months	78	2.7	100.0
Total	2509		
No answer:	264		

TABLE 19

LENGTH OF TIME HAVE HAD MEDLINE CODE
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
6 Months or less	110 35.9%	105 34.3%	354 30.3%	121 33.6%	19 22.1%	32 23.4%	11 44.0%	40 37.0%	792 31.7%
7 to 12 Months	94 30.7%	98 32.0%	360 30.8%	107 29.7%	36 41.9%	49 35.8%	9 36.0%	34 31.5%	787 31.5%
13 to 18 Months	21 6.9%	14 4.6%	117 10.0%	34 9.4%	6 7.0%	8 5.8%	--	11 10.2%	211 8.4%
19 to 24 Months	41 13.4%	51 16.7%	247 21.1%	62 17.2%	14 16.3%	33 24.1%	4 16.0%	12 11.1%	464 18.6%
25 to 30 Months	3 1.0%	3 1.0%	28 2.4%	8 2.2%	2 2.3%	3 2.2%	--	--	47 1.9%
31 to 36 Months	20 6.5%	16 5.2%	42 3.6%	17 4.7%	3 3.5%	9 6.6%	1 4.0%	4 3.7%	112 4.5%
37 to 42 Months	--	2 .7%	4 .3%	--	2 2.3%	1 .7%	--	1 .9%	10 .4%
More than 42 Months	17 5.6%	17 5.6%	18 1.5%	11 3.1%	4 4.7%	2 1.5%	--	6 5.6%	75 3.0%
Column Totals	306 100.0%	306 100.0%	1170 100.0%	360 100.0%	86 100.0%	137 100.0%	25 100.0%	108 100.0%	2498 100.0%
No answer	34	25	94	35	3	8	3	1	

TABLE 20

NUMBER OF PEOPLE SHARING MEDLINE CODE*

N=2661

	Frequency	Percent	Cumulative Percent
None	17	.6	.6
One	2183	82.0	82.7
Two	229	8.6	91.3
Three to Five	167	6.3	97.6
Six or more	65	2.4	100.0
Total	2661		
No answer:	55		

*Respondents were instructed to write "1" if they were the only person to use the code.

TABLE 21

USAGE OF MEDLINE

N=2545

Usage Has:	Frequency	Percent	Cumulative Percent
Increased	763	30.0	30.0
Stayed the Same	1469	57.7	87.7
Decreased	313	12.3	100.0
Total	2545		
No answer:	171		

TABLE 22-A

REASONS GIVEN FOR INCREASE IN USE OF MEDLINE
BY
WHETHER USE HAS INCREASED OR DECREASED

N=678*

	Frequency	Percent
Lack of time	2	.3%
Increases productivity	124	18.3%
The more I learn, the more I use it	25	3.7%
Search for other people	18	2.7%
Enjoy using	13	1.9%
Increased familiarity	292	43.1%
Increased work load/need	169	24.9%
Money reasons	8	1.2%
Other services unavailable	9	1.3%
Better than others	12	1.8%
Change in research needs	6	
Change from different systems	4	.6%
GRATEFUL MED	26	3.8%
Saves time (easier to use)	11	1.6%
Better computer hardware	3	.4%
Total	722	

*Of the 763 individuals who indicated that their usage had increased, 678 indicated reason(s) why this was so. Content of respondent answers was sometimes coded with more than one code; therefore, total % exceeds 100% and frequencies are greater than the N of 678.

TABLE 22-B

REASONS GIVEN FOR DECREASE IN USE OF MEDLINE
BY
WHETHER USE HAS INCREASED OR DECREASED

N=288

	Frequency	Percent
Lack of time	77	26.7%
Decreased work load/need	71	24.7%
Money reasons	30	10.4%
Don't like using	25	8.7%
Confused when using	28	9.7%
Like others better	10	3.5%
Use other services	19	6.6%
Change in research needs	10	3.5%
GRATEFUL MED	3	1.0%
Hardware inoperable (bad telephone lines)	15	5.2%
Forget that it exists	1	.3%
Limited access to computer	2	.7%
Total	291	

*Of the 313 individuals who indicated that their usage had decreased, 288 indicated reason(s) why this was so. Content of respondent answers was coded with more than one code in a few instances; therefore, total % slightly exceeds 100% and frequencies are greater than the N of 288.

TABLE 23

EFFECT OF COST CONSIDERATIONS ON SEARCHING

N=2554

	Frequency	Percent	Cumulative Percent
Never a consideration	1047	41.0	41.0
Rarely a consideration	680	26.6	67.6
Occasionally a consideration	591	23.1	90.8
Frequently a consideration	236	9.2	100.0
Total	2554		
No answer:	162		

TABLE 24

EFFECT OF COST CONSIDERATIONS ON SEARCHING
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
Never	152 48.4%	166 53.7%	429 35.8%	140 38.1%	43 49.4%	55 40.1%	8 30.8%	52 48.1%	1045 41.0%
Rarely	76 24.2%	73 23.6%	338 28.2%	100 27.2%	26 29.9%	36 26.3%	6 23.1%	21 19.4%	676 26.6%
Occasionally	57 18.2%	52 16.8%	321 26.8%	79 21.5%	17 19.5%	33 24.1%	7 26.9%	23 21.3%	589 23.1%
Frequently	29 9.2%	18 5.8%	110 9.2%	48 13.1%	1 1.1%	13 9.5%	5 19.2%	12 11.1%	236 9.3%
Column Totals	314 100.0%	309 100.0%	1198 100.0%	367 100.0%	87 100.0%	137 100.0%	26 100.0%	108 100.0%	2546 100.0%
No answer	26	22	66	28	2	8	2	1	

TABLE 25

REASONS FOR WHICH INDIVIDUALS TYPICALLY SEARCH

N=2556

	Frequency	Percent	Cumulative Percent
Immediate Information	2087	81.7	81.7
Stay Current	263	10.3	91.9
Learn New Areas	123	4.8	96.8
Other	83	3.2	100.0
Total	2556		
No answer:	160		

TABLE 26

REASONS FOR WHICH INDIVIDUALS TYPICALLY SEARCH
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
Immediate Information	266 83.6%	273 88.3%	944 79.1%	304 82.6%	68 78.2%	114 83.2%	19 73.1%	92 85.2%	2080 81.7%
Stay Current	24 7.5%	23 7.4%	150 12.6%	29 7.9%	15 17.2%	12 8.8%	4 15.4%	5 4.6%	262 10.3%
Learn New Areas	17 5.3%	6 1.9%	69 5.8%	15 4.1%	3 3.4%	9 6.6%	1 3.8%	2 1.9%	122 4.8%
Other	11 3.5%	7 2.3%	31 2.6%	20 5.4%	1 1.1%	2 1.5%	2 7.7%	9 8.3%	83 3.3%
Column Totals	318 100.0%	309 100.0%	1194 100.0%	368 100.0%	87 100.0%	137 100.0%	26 100.0%	108 100.0%	2547 100.0%
No answer	22	22	70	27	2	8	2	1	

TABLE 27

OF CITATIONS USUALLY INTERESTED IN RETRIEVING

N=2550

	Frequency	Percent	Cumulative Percent
A Few citations	973	38.2	38.2
All Relevant Citations	1503	58.9	97.1
Other	74	2.9	100.0
Total	2550		
No answer:	166		

TABLE 28

AMOUNT OF INFORMATION RESPONDENTS TYPICALLY INTERESTED IN RETRIEVING
BY
PURPOSE OF THE SEARCH*

Patient Care

Typically interested in receiving	As most common Freq	%	As 2nd most common Freq	%	As 3rd most common Freq	%	Row Total Freq	%
A Few Citations	469	47.6%	191	32.5%	82	27.5%	742	39.7%
All Relevant Citations	491	49.8%	377	64.2%	204	68.5%	1072	57.3%
Other	25	2.5%	19	3.2%	12	4.0%	56	3.0%
Total	985	100.0%	587	100.0%	298	100.0%	1870	100.0%

Education

Typically interested in receiving	As most common Freq	%	As 2nd most common Freq	%	As 3rd most common Freq	%	Row Total Freq	%
A Few Citations	135	42.3%	409	41.0%	141	30.1%	685	38.4%
All Relevant Citations	170	53.3%	570	57.1%	311	66.5%	1051	58.9%
Other	14	4.4%	19	1.9%	16	3.4%	49	2.7%
Total	319	100.0%	998	100.0%	468	100.0%	1785	100.0%

TABLE 28 (cont.)

AMOUNT OF INFORMATION RESPONDENTS TYPICALLY INTERESTED IN RETRIEVING
BY
PURPOSE OF THE SEARCH

	Research/Testing							
	As most common		As 2nd most common		As 3rd most common		Row Total	
Typically interested in receiving	Freq	%	Freq	%	Freq	%	Freq	%
A Few Citations	361	30.5%	136	33.5%	152	45.6%	649	33.7%
All Relevant Citations	794	67.1%	253	62.3%	173	52.0%	1220	63.4%
Other	29	2.4%	17	4.2%	8	2.4%	54	2.8%
Total	1184	100.0%	406	100.0%	333	100.0%	1923	100.0%

*Patient Care, Education, and Research/Testing are each analyzed independently of one another.

TABLE 29

NUMBER OF CITATIONS INTERESTED IN RETRIEVING
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
A Few Citations	139 44.1%	155 50.5%	386 32.4%	146 39.7%	38 43.7%	52 38.0%	10 38.5%	43 39.8%	969 38.1%
All Relevant Citations	170 54.0%	146 47.6%	778 65.2%	204 55.4%	46 52.9%	81 59.1%	15 57.7%	58 53.7%	1498 59.0%
Other	6 1.9%	6 2.0%	29 2.4%	18 4.9%	3 3.4%	4 2.9%	1 3.8%	7 6.5%	74 2.9%
Column Totals	315 100.0%	307 100.0%	1193 100.0%	368 100.0%	87 100.0%	137 100.0%	26 100.0%	108 100.0%	2541 100.0%
No answer	25	24	71	27	2	8	2	1	

TABLE 30

NUMBER OF CITATIONS TYPICALLY RETRIEVED

N=2510

	Frequency	Valid Percent	Cumulative Percent
Too Few Citations	385	15.3	15.3
The Right Number	1533	61.1	76.4
Too Many Citations	592	23.6	100.0
Total	2510		
No answer:	206		

TABLE 31

NUMBER OF CITATIONS TYPICALLY RETRIEVE
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
Too Few Citations	67 21.7%	63 20.6%	152 12.9%	51 14.3%	20 23.5%	18 13.6%	1 3.8%	11 10.5%	383 15.3%
The Right Number	176 57.0%	182 59.5%	734 62.2%	217 60.8%	42 49.4%	92 69.7%	19 73.1%	68 64.8%	1530 61.2%
Too Many Citations	66 21.4%	61 19.9%	295 25.0%	89 24.9%	23 27.1%	22 16.7%	6 23.1%	26 24.8%	588 23.5%
Column Totals	309 100.0%	306 100.0%	1181 100.0%	357 100.0%	85 100.0%	132 100.0%	26 100.0%	105 100.0%	2501 100.0%
No answer	31	25	83	38	4	13	2	4	

TABLE 32

METHOD OF ACCESS
BY
NUMBER OF CITATIONS TYPICALLY RECEIVED

Access Method	Too Few Citations Freq	%	The Right Number Freq	%	Too Many Citations Freq	%	Row Total Freq	%
Always use:								
Direct Command Language	107	10.2	676	64.8	261	25.0	1044	100.0
GM Form Screens	153	23.6	369	56.9	127	19.6	649	100.0

TABLE 33

PERCENTAGE OF CITATIONS RELEVANT TO SEARCH QUERY

N=2399

	Frequency	Percent	Cumulative Percent
0% to 25%	566	23.6	23.6
26% to 50%	841	35.1	58.6
51% to 75%	541	22.6	81.2
76% to 100%	451	18.8	100.0
Total	2399		
No answer:	317		

TABLE 34

PERCENTAGE OF CITATIONS RELEVANT TO SEARCH QUERY BY PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
0 TO 25%	77 27.2%	73 25.4%	258 22.6%	83 24.3%	22 26.8%	23 17.8%	7 31.8%	21 20.6%	564 23.6%
26 TO 50%	96 33.9%	109 38.0%	423 37.0%	111 32.5%	20 24.4%	45 34.9%	5 22.7%	28 27.5%	837 35.0%
51 TO 75%	55 19.4%	55 19.2%	263 23.0%	86 25.1%	20 24.4%	27 20.9%	4 18.2%	31 30.4%	541 22.6%
76 TO 100%	55 19.4%	50 17.4%	199 17.4%	62 18.1%	20 24.4%	34 26.4%	6 27.3%	22 21.6%	448 18.7%
Column Totals	283 100.0%	287 100.0%	1143 100.0%	342 100.0%	82 100.0%	129 100.0%	22 100.0%	102 100.0%	2390 100.0%
No answer	57	44	121	53	7	16	6	7	

TABLE 35

TYPE OF SEARCH TYPICALLY DONE

N=2552

	Frequency	Percent	Cumulative Percent
An Author	81	3.2	3.2
A Journal Title	22	.9	4.0
A Subject	2449	96.0	100.0
Total	2552		
No answer:	164		

TABLE 36-A

AREAS IN WHICH SEARCH INFORMATION IS USED
BY INDIVIDUALS
(Includes ranking of 1, 2, or 3)

N=2716

	Frequency	Percent
Patient Care	1877	69.1%
Education	1793	66.0%
Research/Testing	1929	71.0%
Management/ Administration	201	7.4%
Regulation	79	2.9%
Other	110	4.0%

TABLE 36-B

MOST COMMON AREA FOR WHICH SEARCH INFORMATION IS USED BY INDIVIDUALS

N=2592

	Frequency	Percent
Patient Care	991	38.2%
Education	321	12.4%
Research/Testing	1186	45.8%
Management/ Administration	30	1.2%
Regulation	9	.3%
Other	55	2.1%
Total	2592	100.0%
No answer	124	

TABLE 36-C

AREAS IN WHICH SEARCH INFORMATION IS USED BY INDIVIDUALS
(Breakout of usage within each area of interest)

	Most Common		2nd Most Common		3rd Most Common		Row Total	
	Freq	%	Freq	%	Freq	%	Freq	%
Patient Care	991	52.8	588	31.3	298	15.9	1877	100.0
Education	321	17.9	1003	55.9	469	26.2	1793	100.0
Research/Testing	1186	61.5	407	21.1	336	17.4	1929	100.0
Management/Administration	30	14.9	67	33.3	104	51.7	201	100.0
Regulation	9	11.4	30	38.0	40	50.6	79	100.0
Other	55	50.0	23	20.9	32	29.1	110	100.0

TABLE 37

PRIMARY WORKPLACE
BY
PURPOSE OF SEARCH

	Patient Care		Education		Research/Testing		Mgt/Admin		Regulation	
	1*	1,2 or 3	1	1,2 or 3	1	1,2 or 3	1	1,2 or 3	1	1,2 or 3
Pvt/Solo Practice** (N=340)	234 68.82%	293 86.18%	36 10.59%	243 71.47%	42 12.35%	139 40.88%	3 0.08%	23 6.76%	-- 0.00%	14 4.12%
Group Practice (N=331)	251 75.83%	308 93.05%	28 8.47%	243 73.41%	30 9.06%	142 42.90%	3 0.91%	27 8.16%	1 0.30%	6 1.81%
Coll/Univ Med School (N=1264)	208 16.45%	729 57.67%	130 10.28%	800 63.29%	846 66.93%	1126 89.08%	9 0.71%	42 3.32%	3 0.24%	25 1.98%
Hospital/ Clinic (N=395)	199 50.38%	336 85.06%	76 19.24%	301 76.20%	85 21.52%	243 61.52%	4 1.01%	48 12.15%	--	5 1.27%
Pvt Co/ Business (N=89)	17 19.10%	45 50.56%	14 15.73%	36 40.45%	47 52.80%	66 74.16%	1 1.12%	21 23.60%	2 2.25%	13 14.61%
Government Agency (N=145)	31 21.38%	82 56.55%	18 12.41%	83 57.24%	82 56.55%	116 80.00%	3 2.07%	17 11.52%	2 1.38%	9 6.21%
No Formal Workplace (N=28)	9 32.14%	18 64.29%	4 14.29%	15 53.57%	11 39.29%	21 75.00%	--	2 7.14%	1 3.57%	7 25.00%
Other Workplace	39 35.78%	61 55.96%	15 13.76%	68 62.39%	38 34.86%	69 63.30%	7 6.42%	21 19.27%	--	--

* 1 = Most Common; 1, 2, Or 3 = Combined Ranking
**%s are computed as percent of total respondents in each workplace

TABLE 38

METHOD OF ACCESS USED TO SEARCH MEDLINE*
BY
PURPOSE OF THE SEARCH

Patient Care

Direct Command Language	Most Common Freq	%	2nd Most Common Freq	%	3rd Most Common Freq	%	Row Total Freq	%
Never Use	462	48.6	253	44.5	128	44.0	843	46.6
Sometimes Use	100	10.5	65	11.4	32	11.0	197	10.9
Always Use	388	40.8	251	44.1	131	45.0	770	42.5
Total	950	100.0	569	100.0	291	100.0	1810	100.0

Patient Care

GM Form Screens	Most Common Freq	%	2nd Most Common Freq	%	3rd Most Common Freq	%	Row Total Freq	%
Never Use	457	48.1	303	53.3	163	56.2	923	51.1
Sometimes Use	193	20.3	127	22.4	57	19.7	377	20.9
Always Use	300	31.6	138	24.3	70	24.1	508	28.1
Total	950	100.0	568	100.0	290	100.0	1808	100.0

TABLE 38 (cont)

METHOD OF ACCESS USED TO SEARCH MEDLINE
BY
PURPOSE OF THE SEARCH

Education

Direct Command Language	Most Common Freq	%	2nd Most Common Freq	%	3rd Most Common Freq	%	Row Total Freq	%
Never Use	155	50.5	475	48.8	180	40.2	810	46.9
Sometimes Use	30	9.8	95	9.8	66	14.7	191	11.1
Always Use	122	39.7	403	41.4	202	45.1	727	42.1
Total	307	100.0	973	100.0	448	100.0	1728	100.0

Education

GM Form Screens	Most Common Freq	%	2nd Most Common Freq	%	3rd Most Common Freq	%	Row Total Freq	%
Never Use	152	49.7	500	51.5	239	53.5	891	51.7
Sometimes Use	68	22.2	202	20.8	106	23.7	376	21.8
Always Use	86	28.1	269	27.7	102	22.8	457	26.5
Total	306	100.0	971	100.0	447	100.0	1724	100.0

TABLE 38 (cont)

METHOD OF ACCESS USED TO SEARCH MEDLINE
BY
PURPOSE OF THE SEARCH

Research/Testing

Direct Command Language	Most Common Freq	%	2nd Most Common Freq	%	3rd Most Common Freq	%	Row Total Freq	%
Never Use	488	42.8	165	42.3	149	45.7	802	43.2
Sometimes Use	132	11.6	49	12.6	33	10.1	214	11.5
Always Use	520	45.6	176	45.1	144	44.2	840	45.3
Total	1140	100.0	390	100.0	326	100.0	1856	100.0

Research/Testing

GM Form Screens	Most Common Freq	%	2nd Most Common Freq	%	3rd Most Common Freq	%	Row Total Freq	%
Never Use	646	56.9	211	54.1	173	53.2	1030	55.6
Sometimes Use	228	20.1	81	20.8	71	21.8	380	20.5
Always Use	262	23.1	98	25.1	81	24.9	441	23.8
Total	1136	100.0	390	100.0	325	100.0	1851	100.0

TABLE 38 (cont)

METHOD OF ACCESS USED TO SEARCH MEDLINE
BY
PURPOSE OF THE SEARCH

Management/Administration

	Most Common Freq	%	2nd Most Common Freq	%	3rd Most Common Freq	%	Row Total Freq	%
Direct Command Language								
Never Use	6	21.4	23	35.9	48	47.5	77	39.9
Sometimes Use	5	17.9	11	17.2	12	11.9	28	14.5
Always Use	17	60.7	30	46.9	41	40.6	88	45.6
Total	28	100.0	64	100.0	101	100.0	193	100.0

Management/Administration

	Most Common Freq	%	2nd Most Common Freq	%	3rd Most Common Freq	%	Row Total Freq	%
GM Form Screens								
Never Use	19	67.9	36	57.1	49	48.5	104	54.2
Sometimes Use	6	21.4	12	19.0	25	24.8	43	22.4
Always Use	3	10.7	15	23.8	27	26.7	45	23.4
Total	28	100.0	63	100.0	101	100.0	192	100.0

TABLE 38 (cont)

METHOD OF ACCESS USED TO SEARCH MEDLINE
BY
PURPOSE OF THE SEARCH

Regulation

	Most Common Freq	%	2nd Most Common Freq	%	3rd Most Common Freq	%	Row Total Freq	%
Direct Command Language								
Never Use	3	37.5	8	28.6	12	33.3	23	31.9
Sometimes Use	1	12.5	3	10.7	8	22.2	12	16.7
Always Use	4	50.0	17	60.7	16	44.4	37	51.4
Total	8	100.0	28	100.0	36	100.0	72	100.0

Regulation

	Most Common Freq	%	2nd Most Common Freq	%	3rd Most Common Freq	%	Row Total Freq	%
GM Form Screens								
Never Use	5	62.5	18	64.3	20	55.6	43	59.7
Sometimes Use	2	25.0	5	17.9	9	25.0	16	22.2
Always Use	1	12.5	5	17.9	7	19.4	13	18.1
Total	8	100.0	28	100.0	36	100.0	72	100.0

TABLE 39-A

USE OF MESH

N=2544

	Frequency	Percent	Cumulative Percent
Always	612	24.1	24.1
Usually	1109	43.6	67.6
Occasionally	470	18.5	86.1
Rarely	224	8.8	94.9
Never	129	5.1	100.0
Total	2544		
No answer:	172		

TABLE 39-B

PERCEIVED USEFULNESS OF MESH

N=2475

	Frequency	Percent	Cumulative Percent
Very Useful	662	26.7	26.7
Useful	966	39.0	65.8
Neutral	575	23.2	89.0
Not Useful	192	7.8	96.8
Not at all useful	80	3.2	100.0
Total	2475		
No answer:	241		

TABLE 40-A

USE OF MESH FOR SEARCHING SUBJECT
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
Always	77 24.4%	87 28.4%	273 22.9%	88 24.2%	19 21.8%	25 18.4%	7 26.9%	34 31.5%	610 24.1%
Usually	142 44.9%	137 44.8%	523 43.9%	173 47.5%	35 40.2%	52 38.2%	10 38.5%	32 29.6%	1104 43.6%
Occasionally	41 13.0%	53 17.3%	233 19.5%	59 16.2%	16 18.4%	31 22.8%	5 19.2%	31 28.7%	469 18.5%
Rarely	31 9.8%	16 5.2%	112 9.4%	26 7.1%	11 12.6%	16 11.8%	3 11.5%	8 7.4%	223 8.8%
Never	25 7.9%	13 4.2%	51 4.3%	18 4.9%	6 6.9%	12 8.8%	1 3.8%	3 2.8%	129 5.1%
Total	316 100.0%	306 100.0%	1192 100.0%	364 100.0%	87 100.0%	136 100.0%	26 100.0%	108 100.0%	2535 100.0%
No answer	24	25	72	31	2	9	2	1	

TABLE 40-B

PERCEIVED USEFULNESS OF MESH BY PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
Useful									
1	94 31.2%	90 30.0%	281 24.2%	106 30.1%	20 23.5%	27 20.1%	9 36.0%	33 30.6%	660 26.8%
2	109 36.2%	120 40.0%	455 39.2%	152 43.2%	31 36.5%	50 37.3%	7 28.0%	38 35.2%	962 39.0%
Neutral									
3	65 21.6%	64 21.3%	295 25.4%	69 19.6%	21 24.7%	31 23.1%	5 20.0%	24 22.2%	574 23.3%
Not Useful									
4	17 5.6%	15 5.0%	103 8.9%	17 4.8%	11 12.9%	13 9.7%	4 16.0%	11 10.2%	191 7.7%
5	16 5.3%	11 3.7%	28 2.4%	8 2.3%	2 2.4%	13 9.7%	--	2 1.9%	80 3.2%
Total	301 100.0%	300 100.0%	1162 100.0%	352 100.0%	85 100.0%	134 100.0%	25 100.0%	108 100.0%	2467 100.0%
No answer	39	31	2	43	4	11	3	1	

TABLE 41

REASONS WHY INDIVIDUALS DO NOT USE MESH

N=454

	Frequency	Percent*
Unfamiliar with MeSH	116	25.6%
Cumbersome terms	107	23.6%
Terms too specific	6	1.3%
Terms too general	49	10.8%
No terms for my area	57	12.6%
Inappropriate retrieval	11	2.4%
Lose relevant citations	14	3.1%
Indexing inconsistency	7	1.5%
Text word is easier/better	48	10.6%
No manual/don't want to use	45	9.9%
Other	59	13.0%
Total	519	

*Content of respondent answers was somtimes coded with more than one code; therefore, percentages exceed 100% and frequencies exceed the N of 454. Percentages used are based on the number of individuals responding to this question (454).

TABLE 42

TYPICAL TIME TO SEARCH/REASONABLENESS OF TIME TO SEARCH

Typical time to perform search on MEDLINE

N=2533

	Frequency	Percent	Cumulative Percent
Less than 5 min.	578	22.8	22.8
5 to 10 min.	1047	41.3	64.2
10 to 15 min.	638	25.2	89.3
More than 15 min.	270	10.7	100.0
Total	2533		
No answer:	183		

Reasonableness of time to search

N=2526

	Frequency	Percent	Cumulative Percent
Too long	275	10.9	10.9
Reasonable amt. of time	2106	83.4	94.3
Quicker than expected	145	5.7	100.0
Total	2526		
No answer:	190		

TABLE 43

SATISFACTION WITH SEARCHES DONE BY SELF

N=1318

Satisfied	Frequency	Percent	Cumulative Percent
1	358	27.2	27.2
2	597	45.3	72.5
Neutral			
3	257	19.5	92.0
Dissatisfied			
4	77	5.8	97.8
5	29	2.2	100.0
Total	1318		
No answer:	1398		

TABLE 44

SATISFACTION WITH SEARCHES DONE BY SELF
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
Satisfied									
1	45 27.6%	44 23.8%	155 26.8%	60 27.9%	8 20.5%	25 32.5%	4 40.0%	15 32.6%	356 27.1%
2	57 35.0%	79 42.7%	288 49.7%	92 42.8%	20 51.3%	36 46.8%	5 50.0%	18 39.1	595 45.3%
Neutral									
3	37 22.7%	42 22.7%	105 18.1%	41 19.1%	11 28.2%	10 13.0%	1 10.0%	10 21.7%	257 19.6%
Dissatisfied									
4	15 9.2%	14 7.6%	27 4.7%	14 6.5%	--	4 5.2%	--	3 6.5%	77 5.9%
5	9 5.5%	6 3.2%	4 .7%	8 3.7%	--	2 2.6%	--	--	29 2.2%
Total	163 100.0%	185 100.0%	579 100.0%	215 100.0%	39 100.0%	77 100.0%	10 100.0%	46 100.0%	1314 100.0%
No answer	177	146	685	180	50	68	18	63	

TABLE 45

OVERALL SATISFACTION WITH MEDLINE

N=2539

Satisfied	Frequency	Percent	Cumulative Percent
1	773	30.4	30.4
2	1293	50.9	81.4
Neutral			
3	367	14.5	95.8
Dissatisfied			
4	90	3.5	99.4
5	16	.6	100.0
Total	2539		
No answer:	177		

TABLE 46

OVERALL SATISFACTION WITH MEDLINE
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
Satisfied									
1	112 35.9%	99 32.1%	346 29.0%	109 29.9%	23 27.1%	42 30.9%	9 34.6%	30 28.6%	770 30.4%
2	115 36.9%	147 47.7%	648 54.3%	187 51.2%	45 52.9%	81 59.6%	15 57.7%	54 51.4%	1292 51.0%
Neutral									
3	64 20.5%	44 14.3%	160 13.4%	53 14.5%	15 17.6%	9 6.6%	2 7.7%	17 16.2%	364 14.4%
Dissatisfied									
4	15 4.8%	14 4.5%	38 3.2%	13 3.6%	2 2.4%	4 2.9%	--	3 2.9%	89 3.5%
5	6 1.9%	4 1.3%	2 .2%	3 .8%	--	--	--	1 1.0%	16 .6%
Total	312 100.0%	308 100.0%	1194 100.0%	365 100.0%	85 100.0%	136 100.0%	26 100.0%	105 100.0%	2531 100.0%
No answer	28	23	70	30	4	9	2	4	

TABLE 47

METHOD OF ACCESS
BY
OVERALL SATISFACTION WITH MEDLINE

Method of Access	Overall satisfaction with MEDLINE: Satisfied 1	2	Neutral 3	Dissatisfied 4	5	Row Total
Always use						
Direct Command Language	330 31.2%	543 51.3%	147 13.9%	33 3.1%	5 .5%	1058 100.0%
GM Form Screens	192 29.3%	348 53.0%	93 14.2%	21 3.2%	2 .3%	656 100.0%

TABLE 48

NEED FOR ADDITIONAL INFORMATION IN A MEDLINE CITATION

N=1977

	Frequency	Percent	Cumulative Percent
Yes	775	39.2	39.2
No	1202	60.8	100.0
No answer:	739*		

TABLE 49

VALUABLE INFORMATION NOT FOUND IN MEDLINE CITATIONS

	N=1019		N=1039***	
	Valuable Information		Most Valuable Information	
	Frequency	Percent**	Frequency	Percent
Author address	377	37.0%	116	11.2%
Dosage information	240	23.6%	47	4.5%
Research design	320	31.4%	82	7.9%
Journal section	193	18.9%	31	3.0%
Full text of article	806	79.1%	677	65.2%
Other	116	11.4%	86	8.3%
Total	2052		1039	100.0%

* Some respondents did not answer this question but did select items they'd like to see in a citation (Table 49).
** Multiple reasons were allowed. Total exceeds 100% and frequency exceeds N of 1019.
***The number of respondents selecting a most valuable item is slightly larger than the number selecting valuable items because some respondents only indicated a most valuable item.

TABLE 50

MOST COMMON AREA FOR WHICH SEARCH INFORMATION IS USED
BY
INFORMATION WHICH WOULD BE VALUABLE IN A CITATION

Patient Care
N=475*

Priority of Choice	Additional Information Desired	Frequency	Percent**	Priority of Choice	Additional Information Most Desired	Frequency	Percent
1	Full Text	331	69.7%	1	Full Text	304	64.0%
2	Dosage Information	124	26.1%	2	Dosage Information	30	6.3%
3	Research Design	91	19.2%	3	Other	30	6.3%
4	Author Address	90	18.9%	4	Research Design	25	5.3%
5	Journal Section	79	16.6%	5	Author Address	15	3.2%
6	Other	43	9.1%	6	Journal Section	13	2.7%
					Did not indicate information most desired	58	12.2%
Total		758				475	100.0%

* 991 respondents indicated that they primarily searched for information for patient care (ranking it as #1 in question 20). From this group, 475 indicated additional pieces of information which would be desirable in a MEDLINE citation.

**Multiple responses were allowed; therefore percent exceeds 100 and frequency exceeds N of 475.

TABLE 50 (cont.)

MOST COMMON AREA FOR WHICH SEARCH INFORMATION IS USED
BY
INFORMATION WHICH WOULD BE VALUABLE IN A CITATION

Education
N=133*

Priority of Choice	Additional Information Desired	Frequency	Percent**	Priority of Choice	Additional Information Most Desired	Frequency	Percent
1	Full Text	86	64.7%	1	Full Text	83	62.4%
2	Dosage Information	29	21.8%	2	Other	13	9.8%
3	Research Design	26	19.5%	3	Dosage Information	7	5.3%
4	Author Address	25	18.8%	4	Journal Section	7	5.3%
5	Journal Section	21	15.8%	5	Author Address	5	3.8%
6	Other	14	10.5%	6	Research Design	4	3.0%
					Did not indicate information most desired	14	10.4%
Total		201				133	100.0%

* 321 respondents indicated that they primarily searched for information for Education (ranking it as #1 in question 20). From this group, 133 indicated additional pieces of information which would be desirable in a MEDLINE citation.

**Multiple responses were allowed; therefore percent exceeds 100 and frequency exceeds N of 133.

TABLE 50 (cont.)

MOST COMMON AREA FOR WHICH SEARCH INFORMATION IS USED
BY
INFORMATION WHICH WOULD BE VALUABLE IN A CITATION

Research/Testing
N=564*

Priority of Choice	Additional Information Desired	Frequency	Percent**	Priority of Choice	Additional Information Most Desired	Frequency	Percent
1	Full Text	358	63.5%	1	Full Text	271	48.0%
2	Author Address	241	42.7%	2	Author Address	91	16.1%
3	Research Design	193	34.2%	3	Research Design	53	9.4%
4	Journal Section	85	15.1%	4	Other	40	7.1%
5	Dosage Information	74	13.1%	5	Journal Section	11	2.0%
6	Other	51	9.0%	6	Dosage Information	8	1.4%
					Did not indicate information most desired	90	16.0%
Total		1002				564	100.0%

* 1186 respondents indicated that they primarily searched for information for Research/Testing (ranking it as #1 in question 20). From this group, 564 indicated additional pieces of information which would be desirable in a MEDLINE citation.

**Multiple responses were allowed; therefore percent exceeds 100 and frequency exceeds N of 564.

TABLE 51

ADDITIONAL CAPABILITIES WHICH WOULD BE DESIRABLE IN MEDLINE

	N=2139		N=1992**	
	Additional Capabilities		Most Desirable Capability	
	Frequency	Percent*	Frequency	Percent
Ability to sort citations online	818	38.2%	144	7.2%
Improved capability for printing citations	1480	69.2%	555	27.9%
Sort citations among different databases	481	22.5%	58	2.9%
Improve MEDLINE backfile searching	1535	71.8%	716	35.9%
Improve methods for SDI service	481	22.5%	95	4.8%
More non-English literature indexed	118	5.5%	15	.8%
More "didactic" literature indexed	398	18.6%	65	3.3%
Adjacency of searched Text Words	800	37.4%	171	8.6%
Other	239	11.2%	173	8.7%
Total	6350		1992	100.0%

* Respondents were asked to circle those additional capabilities which they would like to see in MEDLINE; therefore, percent exceeds 100% and frequency is greater than N of 2139.

**Respondents were asked to check the additional capability most desired. Not all respondents indicated a most desired capability.

TABLE 52

MOST COMMON AREA FOR WHICH SEARCH INFORMATION IS USED
BY
ADDITIONAL CAPABILITIES DESIRED

Patient Care

Priority of Choice	Additional Capabilities Desired	N=800* Frequency	Percent**	Priority of Choice	Additional Capability Most Desired	N=757 Frequency	Percent
1	Improve MEDLINE backfile searching	558	69.8%	1	Improve MEDLINE backfile searching	265	35.0%
2	Improved capability for printing citations	543	67.9%	2	Improved capability for printing citations	216	28.5%
3	Ability to sort citations online	310	38.8%	3	Adjacency of searched text words	70	9.2%
4	Adjacency of searched text words	298	37.3%	4	Ability to sort citations online	58	7.7%
5	Sort citations among different databases	180	22.5%	5	More "didactic" literature indexed	28	3.7%
6	More "didactic" literature indexed	172	21.5%	6	Improve methods for SDI service	22	2.9%
					Did not indicate capability most desired	98	13.0%
Total		2061				757	100.0%

* 991 respondents indicated that they primarily searched for information for patient care (ranking it as #1 in question 20). From this group, 800 selected additional capabilities which would be desirable on MEDLINE.

**Multiple responses were allowed; therefore, percent exceeds 100 and frequency exceeds N of 800.

TABLE 52 (cont.)

MOST COMMON AREA FOR WHICH SEARCH INFORMATION IS USED
BY
ADDITIONAL CAPABILITIES DESIRED

Educatio.i

Priority of Choice	Additional Capabilities Desired	N=261 Frequency	Percent	Priority of Choice	Additional Capability Most Desired	N=245 Frequency	Percent
1	Improved capability for printing citations	181	69.3%	1	Improve MEDLINE backfile searching	83	33.9%
2	Improve MEDLINE backfile searching	177	67.8%	2	Improved capability for printing citations	71	29.0%
3	Ability to sort citations online	91	34.9%	3	More "didactic" literature indexed	24	9.8%
4	Adjacency of searched text words	90	34.5%	4	Adjacency of searched text words	16	6.5%
5	More "didactic" literature indexed	84	32.2%	5	Ability to sort citations online	12	4.9%
6	Sort citations among different databases	57	21.8%	6	Sort citations among different databases	9	3.7%
					Did not indicate capability most desired	30	12.2%
Total		680				245	100.0%

* 321 respondents indicated that they primarily searched for information for education (ranking it as #1 in question 20). From this group, 261 selected additional capabilities which would be desirable on MEDLINE.

**Multiple responses were allowed; therefore, percent exceeds 100 and frequency exceeds N of 261.

TABLE 52 (cont.)

MOST COMMON AREA FOR WHICH SEARCH INFORMATION IS USED
BY
ADDITIONAL CAPABILITIES DESIRED

Research/Testing

Priority of Choice	Additional Capabilities Desired	N=1012 Frequency	Percent	Priority of Choice	Additional Capability Most Desired	N=938 Frequency	Percent
1	Improve MEDLINE backfile searching	762	75.3%	1	Improve MEDLINE backfile searching	357	38.1%
2	Improved capability for printing citations	712	70.4%	2	Improved capability for printing citations	253	27.0%
3	Ability to sort citations online	390	38.5%	3	Adjacency of searched text words	73	7.8%
4	Adjacency of searched text words	375	37.1%	4	Ability to sort citations online	71	7.6%
5	Improve methods for SDI service	259	25.6%	5	Improve methods for SDI service	64	6.8%
6	Sort citations among different databases	224	22.1%	6	Sort citations among different databases	29	3.1%
					Did not indicate capability most desired	91	9.6%
Total		2722				938	100.0%

* 1186 respondents indicated that they primarily searched for information for research/testing (ranking it as #1 in question 20). From this group, 1012 selected additional capabilities which would be desirable on MEDLINE.

**Multiple responses were allowed; therefore, percent exceeds 100 and frequency exceeds N of 1012.

TABLE 53

ADDITIONAL CAPABILITIES WHICH WOULD BE DESIRABLE IN MEDLINE
BY
INDIVIDUALS WHO ALWAYS USE DIRECT COMMAND LANGUAGE TO SEARCH

N=963*

	Additional Capability		Most Desirable Capability	
	Frequency	Percent**	Frequency	Percent
Ability to sort citations online	355	36.9%	59	6.1%
Improved capability for printing citations	675	70.1%	256	26.6%
Sort citations among different databases	208	21.6%	17	1.8%
Improve MEDLINE backfile searching	685	71.1%	299	31.0%
Improve methods for SDI service	180	18.7%	29	3.0%
More non-English literature indexed	40	4.2%	8	.8%
More "didactic" literature indexed	137	14.2%	25	2.6%
Adjacency of searched Text Words	357	37.1%	84	8.7%
Other	114	11.8%	71	7.4%
Did not indicate most desired capability	--	--	115	12.0%
Total	2751		963	100.0%

* 1063 respondents indicated that they always searched MEDLINE using direct/command language. From this group, 963 selected additional capabilities which they would like to see in MEDLINE.

**Multiple reasons were allowed; therefore percent exceeds 100 and frequency exceeds N of 963.

TABLE 53 (cont.)

ADDITIONAL CAPABILITIES WHICH WOULD BE DESIRABLE IN MEDLINE
BY
INDIVIDUALS WHO ALWAYS USE GRATEFUL MED FORM SCREENS TO SEARCH

N=577*

	Additional Capability		MOST DESIRABLE CAPABILITY	
	Frequency	Percent**	Frequency	Percent
Ability to sort citations online	189	32.8%	40	6.9%
Improved capability for printing citations	321	55.6%	127	22.0%
Sort citations among different databases	101	17.5%	14	2.4%
Improve MEDLINE backfile searching	368	63.8%	186	32.2%
Improve methods for SDI service	119	20.6%	28	4.9%
More non-English literature indexed	34	5.9%	3	.5%
More "didactic" literature indexed	107	18.5%	14	2.4%
Adjacency of searched Text Words	177	30.7%	44	7.6%
Other	60	10.4%	49	8.5%
Did not indicate most desired capability	--	--	72	12.5%
Total	1476		963	100.0%

* 659 respondents indicated that they always searched MEDLINE using GRATEFUL MED form screens. From this group, 577 selected additional capabilities which they would like to see in MEDLINE.

**Multiple reasons were allowed; therefore percent exceeds 100 and frequency exceeds N of 577.

TABLE 54-A

EQUIPMENT USED WHEN SEARCHING

N=2556

	Frequency	Percent	Cumulative Percent
A PC	2454	96.0	96.0
A Terminal	102	4.0	100.0
Total	2556		
No answer:	160		

TABLE 54-B

PC AVAILABLE AT WORKPLACE

N=2708

	Frequency	Percent	Cumulative Percent
Yes	2600	96.0	96.0
No	108	4.0	100.0
Total	2708		
No answer:	8		

TABLE 55

METHOD OF ACCESS USED WHEN SEARCHING MEDLINE

Access Method Used	Never Use This Method Frequency	Never Use This Method Percent	Sometimes Use This Method Frequency	Sometimes Use This Method Percent	Always Use This Method Frequency	Always Use This Method Percent	Row Total* Frequency	Row Total* Percent
Direct/Command Language	1129	45.9%	268	10.9%	1063	43.2%	2460	100%
GRATEFUL MED Form Screens	1291	52.6%	504	20.5%	659	26.9%	2454	100%
GRATEFUL MED Direct Mode	2046	83.5%	359	14.7%	45	1.8%	2450	100%
Other front-end package	2222	90.7%	124	5.1%	103	4.2%	2449	100%

*Ideally, all row totals should be the same; however, due to respondent error in allocating percentages for each access method, the totals differ slightly.

TABLE 56

METHOD OF ACCESS USED WHEN SEARCHING MEDLINE
BY
PROFESSION*

Direct Command Language	Physician (n=1776)	Nurse (n=99)	Other Health Professional (n=180)	Scientist (n=753)	Student (n=118)	Librarian/ Info Spec. (n=86)	Other (n=207)	Row Total
Never Use (n=1129)	794 49.1%	35 42.7%	66 40.2%	286 40.9%	40 37.4%	9 11.8%	83 47.7%	1129 45.9%
Sometimes Use (n=268)	182 11.2%	8 9.8%	17 10.4%	87 12.4%	13 12.1%	6 7.9%	19 10.9%	268 10.9%
Always Use (n=1063)	642 39.7%	39 47.6%	81 49.4%	326 46.6%	54 50.5%	61 80.3%	72 41.4%	1063 43.2%
Column Totals	1618 100.0%	82 100.0%	164 100.0%	699 100.0%	107 100.0%	76 100.0%	174 100.0%	2920 100.0%
No answer	158	17	16	54	11	10	33	

GRATEFUL MED Form Screens	Physician (n=1776)	Nurse (n=99)	Other Health Professional (n=180)	Scientist (n=753)	Student (n=118)	Librarian/ Info Spec. (n=86)	Other (n=207)	Row Total
Never Use (n=1291)	774 47.8%	50 61.7%	98 60.9%	405 57.9%	70 66.7%	66 85.7%	92 53.5%	1291 52.6%
Sometimes Use (n=504)	357 22.1%	16 19.8%	23 14.3%	147 21.0%	17 16.2%	8 10.4%	35 20.3%	504 20.5%
Always Use (n=659)	487 30.1%	15 18.5%	40 24.8%	147 21.0%	18 17.1%	3 3.9%	45 26.2%	659 26.9%
Column Totals	1618 100.0%	81 100.0%	161 100.0%	699 100.0%	105 100.0%	77 100.0%	172 100.0%	2913 100.0%
No answer	158	18	19	54	13	9	35	

*Multiple responses were received for profession; therefore, some individuals are represented in more than one category. The n's reported here reflect the # of responses to the individual question.

TABLE 57

METHOD OF ACCESS
BY
PRIMARY WORKPLACE

Direct Command Language	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
Never Use	161 54.0%	151 49.3%	499 43.1%	160 46.5%	35 42.7%	65 48.5%	9 34.6%	45 43.3%	1125 45.9%
Sometimes Use	32 10.7%	34 11.1%	128 11.1%	34 9.9%	11 13.4%	17 12.7%	2 7.7%	10 9.6%	268 10.9%
Always Use	105 35.2%	121 39.5%	530 45.8%	150 43.6%	36 43.9%	52 38.8%	15 57.7%	49 47.1%	1058 43.2%
Column Total	298 100.0%	306 100.0%	1157 100.0%	344 100.0%	82 100.0%	134 100.0%	26 100.0%	104 100.0%	2451 100.0%
No answer	42	25	107	51	7	11	2	5	

GRATEFUL MED Form Screens	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
Never Use	123 41.4%	144 46.8%	660 57.4%	182 53.1%	44 53.7%	63 47.0%	18 69.2%	52 49.5%	1286 52.6%
Sometimes Use	74 24.9%	62 20.1%	223 19.4%	66 19.2%	17 20.7%	34 25.4%	3 11.5%	23 21.9%	502 20.5%
Always Use	100 33.7%	102 33.1%	267 23.2%	95 27.7%	21 25.6%	37 27.6%	5 19.2%	30 28.6%	657 26.9%
Column Totals	297 100.0%	308 100.0%	1150 100.0%	343 100.0%	82 100.0%	134 100.0%	26 100.0%	105 100.0%	2445 100.0%
No answer	43	23	114	52	7	11	2	4	

TABLE 58

METHOD OF ACCESS
BY
YEAR IN WHICH HIGHEST DEGREE RECEIVED

Direct Command Language	Pre-1950 (n=83)	1950s (n=270)	1960s (n=523)	1970s (n=1069)	1980s (n=722)	Row Total
Never Use	40 58.8%	125 52.1%	242 52.2%	442 45.1%	260 38.7%	1109 45.8%
Sometimes Use	11 16.2%	36 15.0%	47 10.1%	96 9.8%	75 11.2%	265 10.9%
Always Use	17 25.0%	79 32.9%	175 37.7%	442 45.1%	336 50.1%	1049 43.3%
Column Totals	68 100.0%	240 100.0%	464 100.0%	980 100.0%	671 100.0%	2423 100.0%
No answer	15	30	59	89	51	

GRATEFUL MED Form Screens	Pre-1950 (n=83)	1950s (n=270)	1960s (n=523)	1970s (n=1069)	1980s (n=722)	Row Total
Never Use	27 39.1%	98 40.8%	213 46.0%	528 54.0%	408 61.3%	1274 52.7%
Sometimes Use	24 34.8%	71 29.6%	102 22.0%	182 18.6%	116 17.4%	495 20.5%
Always Use	18 26.1%	71 29.6%	148 32.0%	268 27.4%	142 21.3%	647 26.8%
Column Total	69 100.0%	240 100.0%	463 100.0%	978 100.0%	666 100.0%	2416 100.0%
No answer	14	30	60	91	56	

TABLE 59

PROBLEMS ACCESSING MEDLINE
ON THE NLM COMPUTER

N=2392

	FREQUENCY	PERCENT*
No problems	1287	53.8%
Remembering the connect/ disconnect protocols	386	16.1%
Busy telecommunication lines	466	19.5%
NLM computer not available	281	11.7%
Other	252	10.5%
Total	2672	
No answer:	324	

*Respondents were asked to circle all reasons that applied; therefore, percentages exceed 100% and frequency exceeds N of 2392.

TABLE 60

METHODS USED BY INDIVIDUALS IN LEARNING TO SEARCH MEDLINE

	N=2203		N=2059**	
	Methods Used to Learn		Most Helpful Method Used	
	Frequency	Percent*	Frequency	Percent
Using GRATEFUL MED	999	45.3%	645	31.3%
Using other front-end software	108	4.9%	28	1.4%
NLM-sponsored training course	1095	49.7%	879	42.7%
Course from academic curriculum	95	4.3%	39	1.9%
Other non-NLM training course	205	9.3%	88	4.3%
Self-taught	992	45.0%	242	11.8%
Learned from co-worker	316	14.3%	72	3.5%
Other	138	6.3%	66	3.2%
Total	3948		2059	100.0%

* Respondents were asked to circle those methods which they used to learn to search MEDLINE; therefore, percent exceeds 100 and frequency is greater than N of 2203.

**Respondents were asked to place a checkmark by the most helpful method used in learning to search. Not all respondents indicated a most helpful method.

TABLE 61-A

SATISFACTION WITH 3-5 DAY INITIAL TRAINING COURSE

N=328*

Satisfied	Frequency	Percent	Cumulative Percent
1	170	51.8	51.8
2	105	32.0	83.8
Neutral			
3	44	13.4	97.3
Dissatisfied			
4	6	1.8	99.1
5	3	.9	100.0
Total	328		
No answer:	2388		

*Of the 1095 individuals who indicated they had received some form of NLM sponsored training, 328 had taken a 3-5 day training course.

TABLE 61-B

SATISFACTION WITH 3-5 DAY INITIAL TRAINING COURSE BY OVERALL SATISFACTION WITH MEDLINE

3-5 Day Training	Overall satisfaction with MEDLINE: Satisfied 1 (n=773)	2 (n=1293)	Neutral 3 (n=367)	Dissatisfied 4 (n=90)	5 (n=16)	Row Total
Satisfied						
1 (n=170)	88 72.1%	67 45.3%	10 23.3%	3 30.0%	--	168 51.9%
2 (n=105)	23 18.9%	54 36.5%	21 48.8%	5 50.0%	--	103 31.8%
Neutral						
3 (n=44)	10 8.2%	22 14.9%	10 23.3%	1 10.0%	1 100.0%	44 13.6%
Dissatisfied						
4 (n=6)	--	3 2.0%	2 4.7%	1 10.0%	--	6 1.9%
5 (n=3)	1 .8%	2 1.4%	--	--	--	3 .9%
Column Total	122 100.0%	148 100.0%	43 100.0%	10 100.0%	1 100.0%	324 100.0%

TABLE 62-A

SATISFACTION WITH 6 HOUR BASICS OF SEARCHING MEDLINE COURSE

N=1040*

Satisfied	Frequency	Percent	Cumulative Percent
1	464	44.6	44.6
2	404	38.8	83.5
Neutral			
3	133	12.8	96.3
Dissatisfied			
4	31	3.0	99.2
5	8	.8	100.0
Total	1040		
No answer:	1676		

*Of the 1095 individuals who indicated they had received some form of NLM sponsored training, 1040 had taken the 6 hour Basics of Searching MEDLINE course.

TABLE 62-B

SATISFACTION WITH 6 HOUR BASICS OF SEARCHING MEDLINE COURSE
BY
OVERALL SATISFACTION WITH MEDLINE

	Overall satisfaction with MEDLINE					
	Satisfied		Neutral	Dissatisfied		Row
6 Hour Basics	1 (n=773)	2 (n=1293)	3 (n=367)	4 (n=90)	5 (n=16)	Total
Satisfied						
1 (n=464)	196 61.3%	218 41.0%	37 26.2%	8 25.8%	--	459 44.6%
2 (n=404)	93 29.1%	238 44.7%	58 41.1%	12 38.7%	1 20.0%	402 39.1%
Neutral						
3 (n=133)	20 6.3%	66 12.4%	35 24.8%	9 29.0%	2 40.0%	132 12.8%
Dissatisfied						
4 (n=31)	8 2.5%	9 1.7%	10 7.1%	1 3.2%	1 20.0%	29 2.8%
5 (n=8)	3 .9%	1 .2%	1 .7%	1 3.2%	1 20.0%	7 .7%
Column Totals	320 100.0%	532 100.0%	141 100.0%	31 100.0%	5 100.0%	1029 100.0%

TABLE 63-A

METHODS USED TO LEARN TO SEARCH MEDLINE*
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)
GRATEFUL MED	133 52.2%	130 51.2%	440 42.1%	145 44.3%	32 42.1%	65 53.7%	8 33.3%	43 46.7%
Other Front-End	7 2.7%	8 3.1%	60 5.7%	16 4.9%	8 10.5%	6 5.0%	--	3 3.3%
NLM Training	105 41.2%	113 44.5%	561 53.6%	168 51.4%	35 46.1%	55 45.5%	12 50.0%	43 46.7%
School course	12 4.7%	5 2.0%	54 5.2%	13 4.0%	4 5.3%	4 3.3%	--	3 3.3%
Other Non-NLM Training	15 5.9%	14 5.5%	125 12.0%	28 8.6%	7 9.2%	10 8.3%	1 4.2%	5 5.4%
Self-taught	113 44.3%	112 44.1%	458 43.8%	150 45.9%	44 57.9%	57 47.1%	13 54.2%	41 44.6%
Learned from co-workers	18 7.1%	24 9.4%	153 14.6%	52 15.9%	14 18.4%	26 21.5%	6 25.0%	22 23.9%
Other Method	23 9.0%	18 7.1%	47 4.5%	19 5.8%	4 5.3%	9 7.4%	2 8.3%	16 17.4%
Total Respondents	255	254	1046	327	76	121	24	92
No answer	85	77	218	68	13	24	4	17

*Respondents were asked to circle all methods which were used; therefore, percentages exceed 100 and frequencies exceed number of total respondents for each column.

TABLE 63-B

MOST HELPFUL METHOD USED TO LEARN TO SEARCH MEDLINE
BY
PRIMARY WORKPLACE

	Priv/Solo Practice (n=340)	Group Practice (n=331)	Coll/Univ/ Med School (n=1264)	Hospital/ Clinic (n=395)	Priv Co/ Business (n=89)	Gov't Agency (n=145)	No Formal Workplace (n=28)	Other Workplace (n=109)	Row Total
GRATEFUL MED	102 41.3%	97 38.8%	262 27.1%	96 31.7%	15 22.1%	37 34.9%	6 25.0%	28 31.5%	643 31.3%
Other Front-End	3 1.2%	2 .8%	14 1.4%	4 1.3%	3 4.4%	2 1.9%	--	--	28 1.4%
NLM Training	82 33.2%	92 36.8%	459 47.5%	135 44.6%	26 38.2%	37 34.9%	10 41.7%	35 39.3%	876 42.7%
School course	8 3.2%	1 .4%	20 2.1%	6 2.0%	1 1.5%	1 .9%	1 4.2%	1 1.1%	39 1.9%
Other Non-NLM Training	9 3.6%	5 2.0%	56 5.8%	11 3.6%	3 4.4%	3 2.8%	--	1 1.1%	88 4.3%
Self-taught	24 9.7%	40 16.0%	99 10.2%	34 11.2%	15 22.1%	16 15.1%	4 16.7%	10 11.2%	242 11.8%
Learned from co-workers	6 2.4%	4 1.6%	36 3.7%	12 4.0%	3 4.4%	4 3.8%	2 8.3%	5 5.6%	72 3.5%
Other Method	13 5.3%	9 3.6%	21 2.2%	5 1.7%	2 2.9%	6 5.7%	1 4.2%	9 10.1%	66 3.2%
Column Totals	247 100.0%	250 100.0%	967 100.0%	303 100.0%	68 100.0%	106 100.0%	24 100.0%	89 100.0%	2054 100.0%
No answer	93	81	297	92	21	39	4	20	

TABLE 64-A

METHODS USED TO LEARN TO SEARCH MEDLINE
BY
INDIVIDUALS WHO ALWAYS SEARCH USING DIRECT COMMAND LANGUAGE

Always Use Direct Command Language

	N=906*		N=829	
	Methods Used to Learn		Most Helpful Method Used	
	Frequency	Percent**	Frequency	Percent
GRATEFUL MED	21	2.3%	3	.4%
Other Front-End	12	1.3%	2	.2%
NLM Training	660	72.8%	568	68.5%
School course	53	5.8%	26	3.1%
Other Non-NLM Training	95	10.5%	49	5.9%
Self-taught	402	44.4%	119	14.4%
Learned from co-workers	127	14.0%	32	3.9%
Other method	63	7.0%	30	3.6%
Total	1433		829	100.0%

* 1063 respondents indicated that they always searched MEDLINE using direct/command language. From this group, 906 indicated which methods were used in learning to search.

**Respondents were asked to indicate all methods used; therefore, percent exceeds 100 and frequency exceeds N of 906.

TABLE 64-B

METHODS USED TO LEARN TO SEARCH MEDLINE
BY
INDIVIDUALS WHO ALWAYS SEARCH USING GRATEFUL MED FORM SCREENS

Always Use GRATEFUL MED Form Screen

	N=576*		N=555	
	Methods Used to Learn		Most Helpful Method Used	
	Frequency	Percent**	Frequency	Percent
GRATEFUL MED	536	93.1%	456	82.2%
Other Front-End	18	3.1%	1	.2%
NLM Training	102	17.7%	44	7.9%
School course	19	3.3%	4	.7%
Other Non-NLM Training	28	4.9%	8	1.4%
Self-taught	223	38.7%	22	4.0%
Learned from co-workers	65	11.3%	11	2.0%
Other method	17	3.0%	9	1.6%
Total	1008		555	100.0%

* 659 respondents indicated that they always searched MEDLINE using GRATEFUL MED form screens. From this group, 576 indicated which methods were used in learning to search.

**Respondents were asked to indicate all methods used; therefore, percent exceeds 100 and frequency exceeds N of 576.

TABLE 65

MOST SATISFACTORY ASPECTS OF MEDLINE

N=747

	Frequency	Percent*
Great service/system	64	8.6%
Good content/depth/information	244	32.7%
GRATEFUL MED	149	19.9%
Cost reasonable	140	18.7%
Availability/Hours/Convenience	190	25.4%
Speed/efficiency/time-saving	184	24.6%
Ease of use/user-friendly	86	11.5%
MeSH vocabulary/indexing	52	7.0%
Other NLM databases available	14	1.9%
Training courses	14	1.9%
Service desk/assistance	47	6.3%
Documentation/manuals	18	2.4%
Other	58	7.7%
Total	1260	
No answer	1969	

*Content of respondent answers was frequently coded with more than one code; therefore, percentages exceed 100% and frequencies exceed the N of 747.

TABLE 66

MOST SATISFACTORY ASPECTS OF MEDLINE
BY
ACCESS METHOD USED TO SEARCH MEDLINE

Always Use:	Method of access: Direct Command Language N=305 Frequency	Percent*	GM Form Screens N=194 Frequency	Percent*
Great service/system	27	8.9%	13	6.7%
Good content/depth/info.	121	39.8%	45	23.2%
GRATEFUL MED	3	1.0%	89	45.9%
Cost	75	24.7%	25	12.9%
Availability/hours/ convenience	84	27.6%	49	25.3%
Speed/efficiency/ time-saving	89	29.3%	42	21.6%
Ease of use/user-friendly	26	8.6%	29	14.9%
MeSH vocabulary/indexing	17	5.6%	17	8.8%
Other NLM databases available	6	2.0%	--	
Training courses	7	2.3%	--	
Service Desk/assistance	13	4.3%	15	7.7%
Documentation/manuals	11	3.6%	1	.5%
Other	28	9.2%	8	4.1%
Total	507		333	

*Content of respondent answers was frequently coded with more than one code; therefore, percentages exceed 100% and frequencies exceed the N's of 305 and 194.

TABLE 67

LEAST SATISFACTORY ASPECTS OF MEDLINE

N=874

	Frequency	Percent*
Backfile searching	122	14.0%
Direct/command language searching	96	11.0%
Printing [selective]	89	10.2%
Other NLM system limitations	83	9.5%
Full text not available	63	7.2%
No abstracts for some citations	14	1.6%
Poor coverage in area	48	5.5%
MeSH vocabulary/indexing	120	13.7%
Cost	50	5.7%
GRATEFUL MED limitations	150	17.2%
GRATEFUL MED not available for all microcomputers	68	7.8%
Need for more training	29	3.3%
Need less technical newsletter	3	.3%
Documentation/manuals	40	4.6%
NTIS billing system	29	3.3%
User hardware/software problems	25	2.9%
Service desk/assistance	6	.7%
Other NLM databases	12	1.4%
Other	171	19.6%
Total	1218	

*Content of respondent answers was frequently coded with more than one code; therefore, percentages exceed 100% and frequencies exceed the N of 874.

TABLE 68

LEAST SATISFACTORY ASPECTS OF MEDLINE
BY
ACCESS METHOD USED TO SEARCH MEDLINE

Always Use:	Method of access: Direct Command Language N=387 Frequency	Direct Command Language N=387 Percent*	GM Form Screens N=196 Frequency	GM Form Screens N=196 Percent*
Backfile searching	51	13.2%	30	15.3%
Direct/command language searching	62	16.0%	3	1.5%
Printing [selective]	62	16.0%	8	4.1%
Other NLM system limitations	49	12.7%	3	1.5%
Full text not available	18	4.7%	16	8.2%
No abstracts for some citations	6	1.6%	2	1.0%
Poor coverage in area	21	5.4%	11	5.6%
MeSH vocabulary/indexing	67	17.3%	21	10.7%
Cost	22	5.7%	9	4.6%
GRATEFUL MED limitations	10	2.6%	73	37.2%
GRATEFUL MED not available for all microcomputers	50	12.9%	4	2.0%
Need for more training	10	2.6%	6	3.1%
Need less technical newsletter	3	.8%	--	
Documentation/manuals	23	5.9%	4	2.0%
NTIS billing system	20	5.2%	1	.5%
User hardware/software problems	9	2.3%	4	2.0%

(continued on next page)

TABLE 68 (cont.)

LEAST SATISFACTORY ASPECTS OF MEDLINE
BY
ACCESS METHOD USED TO SEARCH MEDLINE

Always Use:	Method of access: Direct Command Language N=387 Frequency	Percent*	GM Form Screens N=196 Frequency	Percent*
Service Desk/Assistance	1	.3%	3	1.5%
Other NLM databases	5	1.3%	1	.5%
Other	68	17.6%	49	25.0%
Total	557		248	

*Content of respondent answers was frequently coded with more than one code; therefore, percentages exceed 100% and frequencies exceed N's of 387 for Direct Command Language and 196 for GM Form Screens.

TABLE 69

WILLINGNESS TO PARTICIPATE IN FOLLOW-UP STUDY

N=2342

	Frequency	Percent	Cumulative Percent
Yes	2016	86.1	86.1
No	326	13.9	100.0
Total	2342		
No answer:	374		

ATTACHMENT 1

NATIONAL LIBRARY OF MEDICINE
8600 Rockville Pike
Bethesda, MD 20894

INSTRUCTIONS: *The purpose of this questionnaire is to find out how individuals use MEDLINE on the National Library of Medicine computer system, their level of satisfaction with the system, and their views on how it can be improved. The NLM hopes to use this information to provide better service to its users. Unless otherwise indicated, answer each question by either writing your answer in the space provided, or by circling the number in front of the appropriate answer. All your answers will be available only to the study investigators, unless otherwise required by law. If you have any questions about this study, please contact Karen Wallingford at (301) 496-3261.*

SECTION I. GENERAL INFORMATION

1. What is your profession? *(Circle all that apply)*

   1. Physician
   2. Nurse
   3. Other Health Professional
   4. Scientist
   5. Student
   6. Librarian/Information Specialist
   7. Other (specify) _____

2. What is the highest educational degree you hold? _____

3. What year did you receive that degree? _____

4. If you are a health professional, what is your specialty? *(If you are not a health professional, please skip this question.)*

   _____

5. What is your primary work place? *(Circle only one answer)*

   1. Private solo practice
   2. Group practice
   3. College or university or medical school
   4. Hospital or clinic
   5. Private company or business
   6. Government agency
   7. No formal work place (ie, student or otherwise unaffiliated)
   8. Other (specify) _____

6. Do you have a microcomputer (PC) or is one available in your work place?

   1. No
   2. Yes, type: _____

7. How many people (including yourself) share the MEDLINE User ID Code you use? *(If you are the only person who uses this code, please write "1".)* _____ user(s)

8. How many MEDLINE searches do you do on the NLM computer in the average month? *(Do not include searches done for you by someone else.)*
_____ searches

9. How many MEDLINE searches do you have someone else do for you in the average month? *(If you do all of your searches, enter a zero and skip to question 11.)*
_____ searches

10. If other people occasionally or always search MEDLINE for you:

A. Who generally does the searches for you? *(Circle only one answer)*

1. Librarian/Information Specialist
2. Student/Research Assistant
3. Secretary/Administrative Assistant
4. Colleague
5. Family Member
6. Other (specify) _____

B. Under what circumstances do you prefer to have someone else search MEDLINE for you? *(Circle all that apply)*

1. When someone else can do it as easily as I can
2. When I don't have time to do it myself
3. When I need different expertise/system knowledge
4. When I've tried a search myself and have not been satisfied with the results
5. Other (specify) _____
_____
_____

C. Please rate how satisfied you generally are with searches you do yourself, and searches that are done for you by others. *(If you never search MEDLINE yourself, please leave that response blank.)*

	Very Satisfied				Not At All Satisfied
Searches done by:					
1. Yourself	1	2	3	4	5
2. Others	1	2	3	4	5

D. If you are generally not satisfied with MEDLINE searches done for you, (if you circled 4 or 5) please indicate why. *(Circle all that apply)*

1. Inconvenient location
2. Inconvenient hours
3. Have to wait to get search done
4. Cost
5. Unsatisfactory results
6. Other (specify) _____
_____

IF YOU NEVER SEARCH MEDLINE YOURSELF, DO NOT FILL OUT THE REST OF THIS QUESTIONNAIRE. PLEASE RETURN IT IN THE ATTACHED POSTAGE PAID ENVELOPE. THANK YOU FOR YOUR COOPERATION. IF YOU DO SEARCH MEDLINE YOURSELF, PLEASE COMPLETE THE REST OF THIS QUESTIONNAIRE.

SECTION II. SYSTEM USE

11. What factors influence you to search online databases yourself, instead of having someone else do the search for you? *(Circle all that apply, and check the single most influential factor.)*

Factor	Influential Factor	
1.	____	I am more familiar with the subject matter than a search intermediary
2.	____	I get the information faster
3.	____	I enjoy searching
4.	____	It's more cost effective than using a search intermediary
5.	____	No one else is available to do the search for me
6.	____	Other (specify) _____

12. How experienced a user of online databases do you consider yourself to be?

1. Very experienced
2. Somewhat experienced
3. Not very experienced
4. Not at all experienced

13. How long have you been searching MEDLINE on your User ID code?
_____ years _____ months

14. During the time you have been searching, would you say that your use of MEDLINE has:

1. Increased
2. Stayed about the same
3. Decreased

15. If your usage has increased or decreased, please indicate the reasons for the change.
_____
_____
_____

16. How often do cost considerations keep you from doing a MEDLINE search on the NLM computer?

1. Never
2. Rarely
3. Occasionally
4. Frequently

17. How would you rate your overall satisfaction with MEDLINE on the NLM computer system?

Very Satisfied				Not At All Satisfied
1	2	3	4	5

SECTION III. MEDLINE SEARCHES

18. When you search MEDLINE...

A. Is it typically for: *(Circle only one answer)*
1. An immediate information need
2. Staying current in your field
3. Learning about new areas
4. Other (specify) _____

B. Are you typically interested in retrieving: *(Circle only one answer)*
1. Just a few relevant citations
2. All relevant citations from a particular time period
3. Other (specify) _____

C. Do you typically retrieve: *(Circle only one answer)*
1. Too few citations
2. About the right number of citations
3. Too many citations

D. What percent of these citations are typically relevant to your inquiry?
_____ %

19. When you search MEDLINE, do you most often search for: *(Circle only one answer)*

1. an author
2. a journal title
3. a subject

20. Please indicate the primary areas in which you use MEDLINE search information, rank ordered so that your most common use is #1, second most common is #2, etc. Please give no more than three answers.

Rank Order

____ Patient Care
____ Education
____ Research/Testing
____ Management/Administration
____ Regulation
____ Other (specify) _____

21. How often do you use the Medical Subject Headings (MeSH) terms when searching for specific subjects?

1. Always
2. Usually
3. Occasionally
4. Rarely
5. Never

22. How useful do you find the MeSH terms to be?

Very Useful				Not At All Useful
1	2	3	4	5

23. If you think the MeSH terms are generally not useful, or if you never use MeSH terms, please indicate why.

_____

_____

_____

24. How long does it typically take you (at the terminal or microcomputer) to search MEDLINE on the NLM system for citations on a particular subject?

1. Less than 5 minutes
2. 5 to 10 minutes
3. 10 to 15 minutes
4. More than 15 minutes

25. Do you feel that this is:

1. Too long
2. A reasonable amount of time
3. Quicker than expected

26. Are there any types of information that would be valuable to you that you cannot routinely find in a citation?

1. No *(Skip to question 27)*
2. Yes... *(Please circle all of the following types of information that would be valuable to you, and check the single most valuable type of information.)*

Valuable	Most Valuable	
1.	____	Author address
2.	____	Dosage information
3.	____	Research design
4.	____	Journal section (ie, Brief Communications)
5.	____	Full text of article
6.	____	Other (specify) _____

27. Which of the following features or capabilities would you most like to see added to the NLM system? *(Circle as many as you like, and check the one feature you would most like to see.)*

Wanted	Most Wanted	
1.	____	Ability to sort citations online
2.	____	Improved capability for selecting which citations to print
3.	____	Ability to sort citations among different databases
4.	____	Improved capability for searching MEDLINE Backfiles at one time
5.	____	Improved methods for SDI (automated monthly update search) service
6.	____	More non-English literature indexed
7.	____	More "didactic" (ie, educational/instructional/teaching, etc.) literature indexed
8.	____	Ability to specify the "adjacency" of searched Text Words
9.	____	Other (specify)_____

SECTION IV. ACCESSING MEDLINE

28. When you search MEDLINE, do you primarily use:

1. A microcomputer (PC)
2. A terminal

29. Please write in the percent of MEDLINE searches you perform with each of the following methods. Note that your percents should add up to 100. *(If you do not use a method, please write "0".)*

____ % Direct/command language (no user-friendly front-end)
____ % GRATEFUL MED, using form screens
____ % GRATEFUL MED, using option 3, direct mode
____ % Other user-friendly front-end package (specify) _____
100% Total

30. If you use more than one method of searching MEDLINE, under what circumstances do you choose one method over another?

_____
_____
_____

31. What types of problems, if any, do you have accessing the NLM computer? *(Circle all that apply)*

1. No problems
2. Remembering connect/disconnect protocols
3. Busy telecommunication lines
4. NLM computer not available
5. Other (specify) _____

32. How did you learn to search MEDLINE on the NLM computer system? *(Please circle all the methods that you used, and check the one method that was most helpful to you in learning how to search MEDLINE.)*

Method	Used	Most Helpful	
1.		____	Using GRATEFUL MED
2.		____	Using other front-end software (eg, SCI-MATE)
3.		____	Attended NLM-sponsored training course
4.		____	Attended a course as part of an academic curriculum
5.		____	Attended other, non-NLM sponsored training course
6.		____	Self-taught
7.		____	Learned from a co-worker
8.		____	Other (specify) _____

33. If you have attended an NLM-sponsored training course (choice 3 in question 32), please circle the course(s) you attended, and how satisfied you were with the course(s).

Attended?	Very Satisfied				Not At All Satisfied
1. 3-5 day Initial Training Course	1	2	3	4	5
2. 6 hour Basics of Searching MEDLINE	1	2	3	4	5

At some future point the NLM may conduct additional research on topics related to MEDLINE and the MEDLINE search system. Would you be willing to participate in a follow up study?

1. Yes *(Please fill out your name, address and phone number below.)*
2. No

Name: _____
Address: _____
_____
Phone: _____

If you have any additional comments that you would like to make about MEDLINE, please do so in the space below. We are particularly interested in knowing those aspects of MEDLINE with which you are most satisfied, and those aspects of MEDLINE with which you are least satisfied. Please continue on the back of this form if you need additional space.

Most Satisfactory Aspects:

Least Satisfactory Aspects:

Please return this survey in the enclosed postage paid envelope.

Thank you for your time and cooperation.

ATTACHMENT 2

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

National Institutes of Health
National Library of Medicine
Bethesda MD 20894

Dear Colleague:

The National Library of Medicine's basic mission is to improve the dissemination of information important to the progress of medicine and to the public health. In support of this mission, NLM developed MEDLINE, the first online bibliographic database available via a nationwide telecommunications network, in 1971. In the first decade of its existence, MEDLINE's principal users were medical librarians who acted as search intermediaries for practitioners and researchers needing to locate pertinent information in the biomedical and health care literature. In the past few years, however, the number of individuals who search MEDLINE for themselves has increased dramatically. To provide better service to these individual end-users, NLM needs to know more about them, how they use MEDLINE, their level of satisfaction with the current system, and their views on changes that would make the system more effective.

In an effort to obtain this information, the Library is surveying all individuals who search MEDLINE directly on the NLM computer without the aid of a search intermediary. I hope you will take the approximately 15 minutes needed to fill out the enclosed questionnaire and return it in the postage paid envelope provided. While participation is voluntary, we would appreciate receiving your completed questionnaire by October 16.

If you do not search MEDLINE yourself, that is, if you always use a search intermediary, please write across the top of the questionnaire that you do not search MEDLINE yourself, and return it in the postage paid envelope. If you have any questions, contact Karen Wallingford at (301) 496-3261.

In appreciation for your time and participation, a $5.00 credit will be applied to your invoice for MEDLINE system use during the month of December 1987.

The information collection in this study is authorized under Section 465 of the Public Health Services Act. Your responses will be confidential and your answers will be available only to the study investigators, unless otherwise required by law. Survey results will be presented in the aggregate.

NLM is working to provide information services which can assist you in your work. Please help us to make MEDLINE more useful to you.

Thank you for your cooperation.

Yours truly,

Donald A. B. Lindberg, M.D.
Director

Enclosure

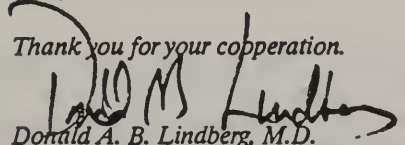
ATTACHMENT 3

Dear Colleague:

Recently you were sent a questionnaire regarding your use of MEDLINE. If you have mailed it to us, thank you for your participation. If you have not yet returned your completed questionnaire, please mail it as soon as possible to: NLM, 8600 Rockville Pike, Bethesda MD 20894. Attn: K. Wallingford, Bldg. 38, B1W-28.

If you need another copy of the questionnaire, call Karen Wallingford at (301) 496-3261.

Thank you for your cooperation.



Donald A. B. Lindberg, M.D.
Director, National Library of Medicine

ATTACHMENT 4

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

National Institutes of Health
National Library of Medicine
Bethesda MD 20894

Dear Colleague:

Approximately four weeks ago you were sent a questionnaire that asked about your use of MEDLINE. The National Library of Medicine is very interested in your views, but has not yet received a completed questionnaire from you. As you may recall, the study is intended to assist us in making MEDLINE responsive to the information needs of persons like yourself who search MEDLINE directly without the aid of a search intermediary. Participation is voluntary, but if you have not yet completed and returned the questionnaire, please take a few minutes and complete the enclosed duplicate copy today. If you have already returned the questionnaire, thank you for participating.

If you do not search MEDLINE yourself, that is, if you always use a search intermediary, please write across the top of the questionnaire that you do not search MEDLINE yourself, and return it in the postage paid envelope. If you have any questions, contact Karen Wallingford at (301) 496-3261.

In appreciation for your time and participation, a $5.00 credit will be applied to your invoice for MEDLINE system use during the month of December 1987.

The information collection is authorized under Section 465 of the Public Health Services Act. Your responses will be confidential and your answers will be available only to the study investigators, unless otherwise required by law. Survey results will reported in the aggregate.

Thank you for your cooperation.

Yours truly,

Donald A. B. Lindberg, M.D.
Director

Enclosure

ATTACHMENT 5

Explanation of Queries Used to Pull Respondent Sample and Breakout of Sample by MMS User Classification Code

There were three queries run against the MEDLARS Management Section's (MMS's) USERS file in which basic information on users of the NLM databases is stored. In each query, we were only interested in those users who had an active billing code. This did not ensure that they actively used their code, but, at least, they had not asked for it to be canceled. MMS uses a set of classification codes (see attached) to identify the different types of users on the system. There are also a set of administrative codes originally developed to identify the type of institution -- e.g., federal, state, non-government/not-for-profit, for profit/commercial -- which were refined in 1986 to try to track the growing number of individuals requesting codes. Both sets of codes have undergone various revisions over the years which had to be taken into consideration in refining queries for pulling the respondent sample.

The following is a breakout of the respondent sample according to the MMS classification codes:

Class. Code	Classification Type	# in Sample
100's	Direct Health Care	3112
200's	Health Education	411
300's	Health-Related Research or Resource	602
400's	Legislative, Regulatory, Planning Agencies	19
500's	Scientific or Technical Products and Services	48
600's	General Products and Services	97
700's	Information resource/Library	6
800's	Other educational institutions/Personnel	18
Total		4313

**** NLM MEDLARS USER TYPE CLASSIFICATION ****

0 - No Classification Type Assigned (includes NLM in-house and foreign codes

100 - DIRECT PATIENT CARE
- 101 - Hospital/inpatient facility (inc. osteopathic, psychiatric)
- 102 - Outpatient facility/HMO
- 103 - Practitioner, physician (inc. osteopaths and M.D.'s)
- 104 - Practitioner, dentist
- 105 - Practitioner, veterinarian
- 106 - Practitioner, nurse
- 107 - Other direct care
- 108 - Students in health education

200 - HEALTH EDUCATION
- 201 - Academic Health Science Center
- 202 - Medical School
- 203 - Osteopathy School
- 204 - Dental School
- 205 - Veterinary School
- 206 - Nursing School
- 207 - Pharmacy School
- 208 - Optometry School
- 209 - Podiatry School
- 210 - Chiropractic School
- 211 - Public health/health administration program
- 212 - Allied health program
- 213 - AHEC/continuing professional education program
- 214 - Other health-related education program
- 215 - University/college not specified above
- 216 - Prof., teacher, instructor in health education

300 - HEALTH-RELATED RESEARCH OR RESOURCE
- 301 - Medical/biomedical research institution
- 302 - Scientific research (primary functions outside the scope of biomedicine
- 303 - Medical/scientific society or association
- 304 - Medical/scientific library or information resource
- 305 - Health care consumer/patient support group
- 306 - Health insurance
- 307 - Other support activity
- 308 - Medical/biomedical research

400 - LEGISLATIVE, REGULATORY, PLANNING AGENCIES
- 401 - Health administration/health planning/HSA
- 402 - Health care/drug regulation or legislation
- 403 - Scientific regulation/legislation/administration
- 404 - Environment/energy/space technology/agriculture/safety regulation, legislation, or administration
- 405 - Military application
- 406 - Law enforcement
- 407 - General regulation/legislation/administration

500 - SCIENTIFIC OR TECHNICAL PRODUCTS AND SERVICES
- 501 - Pharmaceuticals
- 502 - Health care supplies/equipment/services
- 503 - Chemicals/plastics/petroleum/cosmetics
- 504 - Food/agriculture
- 505 - Energy/environment/space technology
- 506 - Computers/electronics/engineering
- 507 - Other scientific/technical product or service

600 - GENERAL PRODUCTS AND SERVICES
- 601 - (Not currently in use for classification)
- 602 - Information broker
- 603 - Publisher/media
- 604 - Law firm/lawyer
- 605 - Insurance other than health insurance
- 606 - Trade/welfare
- 607 - Other
- 608 - Science writer

700 - INFORMATION RESOURCE OR LIBRARY
- 701 - Information resource/library

800 - OTHER EDUCATIONAL INSTITUTIONS/PERSONNEL